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## The New Euston and an Historical Link

ON Tuesday last we were privileged to view an impressive 100,000-ton blasting operation at Caldon Low quarries (see page 141), and were informed that a suitable piece of the limestone from this blast will be used by the L.M.S.R. to form the foundation stone for the new Euston station. If this proves to be so, a fascinating 160-year link will be provided between the most modern London terminus and the very early days of railway enterprise. On May 13, 1776, the Trent & Mersey Canal Company, which had been formed ten years earlier, secured an Act to construct a branch canal from Etruria to Froghall and a railway thence to the Caldon quarries. This railway was the second in England to be built under Parliamentary powers (preceded only by the Middleton colliery line at Leeds) and was probably the first ever constructed for public traffic. In the Act of 1776 reference is made to an agreement between the then proprietors of the quarries (among whom was the Earl of Shrewsbury) and the canal company, under which the quarry owners were required to supply certain quantities of limestone to the canal company on a royalty basis. In 1841 the quarry owners found this impracticable and a new agreement was made enabling the canal company to quarry the stone itself, subject to certain royalty payments. The whole undertaking passed into the hands of the North Staffordshire Railway in 1847 and thus to the L.M.S.R. on grouping in 1923. The railway worked the quarries until 1934 when they were leased to Hadfields (Hope and Caldon Low Quarries) Limited.

## Railway Returns for 1937

The railway returns for 1937 recently published by the Ministry of Transport show that on railways in Great Britain other than London Transport railways, passenger journeys, excluding those taken by holders of workmen's and season tickets, numbered 659,098,929, an increase of 3.27 per cent., with receipts of £46,797,485, which were higher by £2,543,422 or 5.74 per cent. First class ordinary passengers increased in number from 14,330,040 to 14,958,297, second class from 1,591,713 to 1,690,521, and third class from 622,286,360 to 642,450,111, and there was an increase in the average receipt per journey in each class. First class ordinary receipts increased 8.10 per cent., second class 25.91 per cent., and third class 5.33 per cent. The proportion of journeys (other than those by holders of workmen's and season tickets) made with day or half-day excursion tickets was 69.81 per cent. in 1937, against 69.96 per cent. in 1936, with proportionate receipts of 31.79 per cent. in 1937 and 32.14 per cent. in 1936. In the case of period tickets the proportion in numbers was 8.21 per cent. in 1937 against 8.17 per cent. in 1936, but the proportion in receipts fell from 41.16 per cent. in 1936 to 41.08 per cent. in 1937. Higher class merchandise receipts amounted to £42,907,395, an increase of £1,161,042 or 2.78 per cent. Minerals and merchandise (classes 1-6) produced receipts of £15,055,811, an improvement of £864,263 or 6.09 per cent., and the coal class receipts of £35,288,404 were higher by £2,374,223 or 7.21 per cent.

\* \* \* \*

## The Week's Traffics

The combined decrease in the traffics of the four group companies for the past week is £187,000, comparing with £231,000 for the previous week, and is made up of £142,500 from merchandise and £44,500 from coal. For the 27 weeks of the present year the gross earnings are £79,967,000, a decrease of £2,028,000 or 2.47 per cent. The respective contributions to this total are: Passenger train traffic £34,572,000, a net decrease of £184,000; merchandise £28,041,000, a decrease of £1,393,000; and coal £17,354,000, a decrease of £451,000. On the passenger side the L.M.S.R. has an aggregate of £12,806,000, with an increase of £19,000.

	27th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R.	+ 7,000	- 63,000	- 6,000	- 62,000	- 842,000	- 2.54
L.N.E.R.	- 5,000	- 45,000	- 26,000	- 76,000	- 714,000	- 2.93
G.W.R.	+ 2,000	- 28,000	- 10,000	- 36,000	- 354,000	- 2.58
S.R.	- 4,000	- 6,500	- 2,500	- 13,000	- 118,000	- 1.09

London Transport receipts for the past week showed an increase of £7,900. The aggregate for the two weeks of the new financial year amounted to £1,153,300, an increase of £9,000.

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## Three Months' Goods Train Traffics

Freight train traffics for all standard gauge railways in Great Britain for the twelve weeks ended March 19, 1938, showed on the whole a rise of 0.20 per cent. in units and of 2.33 per cent. in receipts compared with the corresponding period of 1937 as indicated in the analysis published with the Ministry of Transport statistics for the month of March, 1938. The improvement in units was wholly in minerals and merchandise (classes 1-6), which with 13,568,355 tons had an increase of 979,732 tons or 7.78 per cent. This class of traffic earned £3,564,475, a gain of £300,807 or 9.22 per cent. Coal class tons numbered 44,966,463, a decrease of 381,901 tons or 0.84 per cent., but produced receipts of £9,045,189, which were higher by £370,189 or 4.27 per cent. In the higher class

merchandise of 11,390,549 tons there was a fall of 410,660 tons or 3.48 per cent., and the receipts of £9,543,409 therefrom were lower by £134,026 or 1.38 per cent. A decrease in this class of traffic both in tonnage and receipts was shown through the twelve weeks. Classes 1-6 showed an improvement throughout although the increase in receipts was always greater than the increase in tonnage. Coal class tonnage was up 354,424 tons in January, but down 20,642 tons in February, and down 715,683 tons in March, although the receipts were up in each period. The livestock receipts of £249,233 for the twelve weeks were lower by £25,989 or 9.44 per cent.

\* \* \* \*

### Overseas Railway Traffics

It is now possible to show complete traffic estimates of Argentine railways for the financial year which ended on June 30 last. Gross traffic receipts of the Buenos Ayres & Pacific for the year may be taken at £4,605,900, a decrease of £450,781. For the Buenos Ayres Great Southern the estimated total is £7,721,275, a decrease of £9,855. The Buenos Ayres Western has earned £2,354,405, a decrease of £262,547, and the figure for the Central Argentine is £6,214,396, a decrease of £1,821,602. In all these cases, however, the receipts for the financial year 1937-38 exceed those for the financial year 1935-36. It should be noted that the aggregate traffics of Argentine railways in the current financial year are for nine days, against ten days of the previous year.

	No. of Weekly Week Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific	2nd 73,263	- 10,484	92,494	- 25,062
Buenos Ayres Great Southern	2nd 127,171	+ 18,672	163,337	+ 3,722
Buenos Ayres Western	2nd 41,811	- 1,365	50,185	- 8,933
Central Argentine	2nd 110,086	- 48,300	134,246	- 86,656
Canadian Pacific	27th 476,400	- 51,000	12,734,000	- 1,151,400
Bombay, Baroda & Central India	13th 231,075	- 2,925	2,418,600	- 67,350

For the 52 weeks ended June 25, 1938, the Central Uruguay Railway secured sterling receipts of £962,025, an increase of £28,858.

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### Tunisian Railways

The railways of Tunisia, according to a Report on Economic and Commercial Conditions in Tunisia issued by the Department of Overseas Trade, show considerable all-round decreases as compared with 1931, due partly to the general economic situation of the country and partly to road competition affecting the transport of both goods and passengers. There are three systems: one the State Railways, worked under concession by an operating company; the second the Sfax-Gafsa system operated by the Compagnie des Phosphates; and the third an electric railway serving La Goulette and certain semi-suburban areas on and near the Lake of Tunis and the coast. The following details are given regarding the operation of the systems in 1935:—

	State Railways	Sfax- Gafsa System	T.G.M. Electric Railway
Length of line, km. . . . .	1,610	455	34
Passengers carried . . . . .	2,978,399	166,629	7,651,897
Passenger receipts, fr. . . . .	10,989,828	1,316,676	5,904,909
Goods carried, tonnes . . . . .	1,562,255	1,959,487	2,662
Goods traffic receipts, fr. . . . .	34,896,241	28,027,569	5,241

The large deficits on the railways since 1920 have created a very serious position although a great effort was made in 1935 to remedy the situation. The following figures of deficits are given: 1931, fr. 57,724,126; 1932, fr. 64,167,410; 1933, fr. 73,284,899; 1934, fr. 71,437,106; 1935, fr. 55,916,689. Meanwhile, the same report mentions that the protectorate has spent 167 million francs on improving the roads.

### Leopoldina Railway Results

An increase of 14.39 per cent. in the gross sterling receipts of the Leopoldina Railway for the year 1937 was almost entirely counterbalanced by an increase of 15.42 per cent. in working expenses and by differences in exchange which cost the company £3,133. Due to an excellent crop year, greater prosperity up country, and a very large carry-over of coffee and sugar traffic from the 1936 crops, goods traffic attained further record tonnage figures. Operating conditions were no easier than in 1936, and pre-existing difficulties of handling increasing traffic and combating competition, with insufficient rolling stock and limited workshops capacity and equipment, remained unaltered.

	1937	1936
Passengers	23,962,207	24,931,124
Goods, tons	1,999,356	1,956,396
Operating ratio, per cent.	88.55	87.75
Passenger receipts	320,326	288,200
Goods receipts	738,034	647,666
Gross receipts	1,200,194	1,049,224
Working expenses	1,062,725	920,728
Net receipts	137,469	128,496

After allowing for prior charges, &c., there is a loss for the year of £206,147.

\* \* \* \*

### Conditions of Service for Signalmen

Exactly twelve months have passed since the Railway Staff National Tribunal last met to hear and decide a major issue in dispute between the railway companies and the railway trade unions. Next week, the tribunal is to assemble to hear a claim brought by the National Union of Railwaymen on behalf of the signalmen employed by the four main-line railway companies. The wages and conditions of service of signalmen are governed by an agreement reached in May, 1922, and the union is now seeking to effect some important modifications, not only as regards the actual scales of pay applicable, but also in the bases for determining the marks upon which the scales of pay were laid down over fifteen years ago. There have, of course, been very considerable changes in the realm of railway signalling during recent years and the tribunal will, no doubt, be called upon to hear opposing arguments as to the effect which those changes have had upon the work of signalmen. According to the current edition of "Facts about British Railways" there are no fewer than 10,297 signal boxes in operation and these range from the tiny roadside cabins to the modern power-worked boxes at the great termini. It is certain that much interest will be taken in the presentation of the union's case and in the reply of the companies, while the decision of the tribunal will be keenly awaited.

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### Dearth of Engineers in Germany

Concern is being expressed in the German press at the falling off in the number of entrants to the engineering profession, attributed by some to the belief that better opportunities of reaching comfortable positions exist in other directions, especially in the now greatly enlarged armed forces. The four-year plan, however, not to speak of other policies of the present régime, calls for considerable engineering activity, and the decrease in students is regarded as most unsatisfactory. The average annual number of those entering the so-called technical high schools was about 20,000 from 1925 to 1930, but then steadily declined, there being only 9,602 students therein last year. The same applies to the more specialised schools (*Fachschulen*). In 1930-1931 there were some 12,800 civil engineering students, but in 1936 only 6,400. Mechanical and electrical engineering students averaged

some 17,500 from 1921 to 1927, since when the figure has fallen to 7,118, a decline of 60 per cent. in 10 years. These results—described as “alarming” by the press—have led to a certain revision of the conditions of entry and the examinations in certain colleges, and the institution of special arrangements to encourage young men to enter the technical professions.

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### French versus British

By coincidence we recently had the interesting experience of travelling within a week behind both one of the Chapelon Pacifics of the French National Railways and one of the streamlined “A4” Pacifics of the L.N.E.R., the former loaded to 600 gross tons, and the latter with an eighteen-coach train of 660 gross tons. The gradients of the two routes, Paris—Boulogne and York—Grantham, were very similar, but the British engine had the disadvantage of a succession of severe permanent way checks with which to cope, whereas the French engine had a clear road. Of the French locomotive's work, the finest features were the recovery, mostly up 1 in 200, from 50½ m.p.h. on the lower part of Surveilliers bank, to 55½ m.p.h. at the summit, and a fall only from 71½ to 61 m.p.h. up the longest 1 in 250 stretch of the ascent to Gannes; 115.1 miles from Surveilliers to Rang-du-Fliers, including Creil and Amiens slacks, were covered in exactly 106 min. The British locomotive, with one of the heaviest trains we recollect in this country, fell from 61 to 49½ m.p.h. up 3 miles at 1 in 178-200 to Markham, and between permanent way slows covered 26.8 miles from Black Carr to Carlton, over two minor summits, in 26 min. 11 sec.; for the 82.7 miles from York to Grantham the net time of 86½ min. was only one minute over schedule. With a reduced load of 595 tons, the 105.5 miles from Grantham to King's Cross were covered in 107 min. net.

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### The Fuel Problem in Roumania

A writer in the Roumanian *Railway Bulletin* (*Buletinul Căilor Ferate*) utters a warning on the decline in fuel products in Roumania, and the effect this must produce on the economic life of the country. The oil reserves, which have hitherto enabled Roumania to export large quantities, are said to be within a few years of exhaustion. In 1937 production fell by 20 per cent. compared with 1936. Before long the country will see itself obliged to import to meet its own needs. Severe criticism is passed by this writer on the way in which the timber supplies have been encroached on without any serious steps being taken to replant; the laws that do exist for the preservation of the forests have been infringed with impunity and the offenders allowed to go unpunished for political reasons. Fortunately, Roumania is rich in coal deposits and a good export trade might be developed if the Government would deal with the problem in a constructive manner. There are also good supplies of natural gas, such as methane, which could be developed for home consumption. An energetic policy is needed in the national interest, to use supplies advantageously and prevent waste.

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### U.S.A. Railroads, Editors, and Agriculture

Probably as a result of the vast distances between different points on the North American continent, and also doubtless because of local patriotism, the United States has never possessed national newspapers. At the recently held 53rd annual convention and tour of the National Editorial Association, therefore, Mr. Daniel Willard, President of the Baltimore & Ohio Railroad, was able to remark that most of the 500 newspaper editors present

represented agricultural sections of the country. The members of the convention on June 26 took a trip over some of the most beautiful parts of the B. and O. system, and were given a specially-produced number of the *Baltimore & Ohio Magazine* as a memento of the occasion. Appropriately enough this took the form of a special Farm Number outlining what the railway had done to foster agricultural development during the past fifteen years. The B. & O. was a pioneer among eastern railroads in lending practical aid to the farming industry in the territory it serves, and at the present time its activities include running special trains in the interests of dairy development, soil improvement, and so forth; ram sales and livestock grading demonstrations; and junior poultry, potato, calf club projects and scholarships. In all this work the railway co-operates with the United States Department of Agriculture, State colleges of agriculture, and other public interests. These activities have justified themselves both by fostering increased traffic and also through the goodwill engendered.

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### The B. & O. as a Pioneer

That fostering agriculture is but one of many pioneering activities of the Baltimore & Ohio Railroad was also shown in the special number of the *Baltimore & Ohio Magazine* to which we refer in our previous note. One feature of this issue was an article entitled “B. & O. Firsts” which pointed out that this line, as America's first commercial railroad, was obliged to be a “trail blazer” from the beginning; “that it sold the first public railroad transportation in this country; ran the first American-built locomotive; first designed and used the integral-built wheel and axle that has been fundamental in rail transport ever since; that over its lines to its station in Baltimore from the Capitol in Washington, and by its help, was flashed the pioneer telegraph message, “What Hath God Wrought?”; that it was the first railroad to enter Washington, cross the Alleghenies and reach the Ohio River; . . . and nearly thirty years ago, shortly after Mr. Daniel Willard became its president, the company granted the right of collective bargaining to its employees.” Of the many advances that the American railroads have made during recent years, none has been more far-reaching nor more in the interest of both the public and the railroads than air-conditioning. The B. & O. had the first air-conditioned car to go into regular service, 1930; the first air-conditioned train, 1931; and the first air-conditioned sleeping car train, 1932.

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### Remarkable Beyer-Garratt Locomotive Performance

For a stud of 36 locomotives to cover a total running mileage of 178,428, or an average of nearly 5,000 miles each in a single month, is a notable performance reflecting great credit on the operating efficiency of the railway concerned, as well as on the design, construction, and maintenance of the particular locomotives. On page 127 of this issue we illustrate a new 2-8-2+2-8-2 Beyer-Garratt locomotive for the Rhodesia Railways, and it is on this system that the record mentioned has been achieved with Beyer-Garratt locomotives of 2-6-2+2-6-2 and 2-8-2+2-8-2 wheel arrangements. To emphasise the outstanding nature of the performance it is necessary to remark that these locomotives work over narrow (3 ft. 6 in.) gauge single lines laid with 60-lb. rail, and that they have driving wheels of the small diameter of 4 ft. For the peculiar conditions of operating in Rhodesia where gradients are severe and curvature sharp and frequently continuous, and where it is necessary to haul heavy loads over long distances, the Beyer-Garratt type of articulated locomotive appears to be unexcelled.



## Sir Follett Holt on "Whither Transport?"

IN his contribution to the book, "Where Do We Go From Here?" reviewed on page 111, Sir Follett Holt\* discusses transport. "The carriage of people, goods, and messages is the greatest social service of modern times," he says, and adds the comment that "all should now strive to devise a system under which the advantage of cheap money is obtainable . . . for the development of the social service." That is indeed the crux. "The war," says Sir Follett Holt, "provided to the engineer and scientist unlimited funds and other resources and left, as far as we can judge, one and only one good legacy behind it." And the reason why funds were and could be supplied thus? Simply that, in the dire emergency, money was properly regarded as only a means to an end. Every resource that could be used by the scientist and the engineer was aided in its development by as much money as was necessary. In other words, the reality of things was not subordinated to the abstraction of figures. The end—winning the war—was clearly defined, and the accountancy system, which it is the essential purpose of money to facilitate, was the means. Nowadays, having no such clear aim as winning a war, we tend to give money, a means, altogether undue prominence.

Consider how the problems of the provider of transport would dissolve if the emphasis were shifted, as Sir Follett Holt's racily written contribution seems to suggest, by the provision of money enough. The railway engineer in particular would be given a new freedom to show what railways could really do. The road transport man, in the first flush of the internal combustion engine's development—like the early railwayman—has been immensely helped by the comparatively free flow of money, as a means, to enable him to provide efficient road transport. If the railways had received merely the normal monetary remuneration for their services during the war, how greatly less would their present financial burden have been. As it is, the railways are—to quote Sir Follett Holt again—"adapting themselves as speedily as their financial circumstances will allow, to the demands of modern life"; and their efforts have not been discreditable.

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## Kenya & Uganda Railways and Harbours

THE services operated by the Kenya & Uganda Railways and Harbours Administration consist of 1,622 miles of open lines, metre gauge track, 3,817 route miles of steamer services, and 75 miles of road motor transport (exclusive of motor feeder services). The main line, 879 miles in length, extends from Mombasa, in Kenya, to Kampala in Uganda, and passes through Nairobi, Nakuru, Tororo, and Jinja. Kisumu, where the main workshops of the lake marine services are situated, is connected with the main line at Nakuru by a local line of 131 miles. Eastern Uganda cotton districts are served by the Tororo—Soroti line of 100 miles, and a connection with the Tanganyika Railways is provided by the Voi—Kahe

line of 92 miles. Results of the combined services for the year 1937, as shown by the report from Brigadier-General G. D. Rhodes, the General Manager, were even better than those for the very satisfactory year 1936. Combined earnings of all services amounted to £3,228,765, an increase of £242,174 or 8.11 per cent. on 1936. The combined ordinary working expenditure of £1,460,765, exclusive of contributions to renewal funds, shows an increase of £139,102 or 10.52 per cent. The net earnings balance of £1,438,883 over total expenditure on revenue account gives a return of 6.5 per cent. on the total capital expenditure of £22,151,873, and of 10.28 per cent. on the interest-bearing proportion (£14,000,098) of this total. This balance covers interest and sinking fund charges of £854,557, leaving a surplus of £584,326. Comparative results of working the railway services (inclusive of lake steamers and motor transport, but exclusive of harbour services) are shown in the accompanying table:—

	1937	1936
Passengers . . . . .	771,471	521,297
Public traffic, tons . . . . .	1,008,128	960,507
Revenue train-miles . . . . .	2,690,587	2,456,713
Public freight ton-miles . . . . .	426,066,463	409,439,382
Public ton-mile receipts . . . . .	11.269 cents	10.963 cents
Average haul, public traffic . . . . .	403 miles	412 miles
Operating ratio, per cent. . . . .	46.45	45.20
Passenger receipts . . . . .	193,109	171,066
Public goods receipts . . . . .	2,400,697	2,244,245
Gross earnings . . . . .	2,715,824	2,527,158
Working expenditure . . . . .	1,261,278	1,142,276
To renewal funds . . . . .	345,164	351,397
Miscellaneous transactions (net) . . . . .	Cr. 43,135	Dr. 20,462
Net revenue . . . . .	1,152,217	1,013,023
Loan charges, &c. . . . .	635,759	634,363
Surplus . . . . .	516,458	378,660

Although an all-round reduction in fares was applied as from January 1, 1937, no appreciable increase in first and second class traffic resulted. An increase of £22,193, or 27 per cent. was, however, shown in third class receipts, and total passenger receipts were the highest since 1931. Parcels and luggage receipts improved from £36,815 to £38,942. Merchandise carried for the public increased by 47,621 tons or 4.96 per cent., and the receipts therefrom by £156,452 or 6.97 per cent. As a result of an increase of approximately 50,000 tons in traffic conveyed at class rates and of a decrease of about 3,000 tons in traffic conveyed at the low exceptional and export rates, the average ton-mile receipt shows an appreciable increase over that for 1936. The increased amount of work done by the railway during 1937 compared with 1936, as reflected in the increased ton-mileages is mainly responsible for the increase of £119,002 or 10.42 per cent. in ordinary working expenditure, against an increase of £188,366 or 7.45 per cent. in gross earnings. Higher prices for materials and stores also contributed to the increase. From a traffic operating aspect several unusual features resulted in the efficiency figures for 1937 proving slightly less satisfactory than those for 1936. The usual peak movement of cotton lint, cotton seed, and maize during the early months of 1937 was intensified by the early opening of the cotton season. The necessity to evacuate this increased traffic at pressure led to an increase in assisting and light engine mileage and empty wagon mileage. There was also a breakdown of regular arrivals of coal supplies from South Africa, which traffic normally gives a certain amount of back-loading from the coast in the early part of the year. In consequence, approximately 86,000 tons of coal had to be conveyed together with normal supplies in the latter part of the year, when there was no great flow of downward traffic, and this involved an inordinate amount of empty wagon mileage. The slight set-back in the operating statistics does not, therefore, indicate any lowering

\*The following biographical note is quoted from the book:—

SIR FOLLETT HOLT, K.B.E., M.Inst.C.E. A son of the late Robert Hallett Holt of Lincoln's Inn, Registrar of the Land Registry Department, Sir Follett Holt during his engineering training was fortunate in falling under the influence of Professors Ayerton and Perry and of Sir Alexander Rendel. He was a pupil also for some years at the Nine Elms (L. & S.W. Railway) Works. In the early part of his career he became Chief Engineer and General Manager first of the Great Western Railway of Brazil and then of the Entre Rios Railways. Now, apart from other activities, he is the Chairman of the Buenos Ayres Great Southern Railways, Buenos Ayres Western Railway, and of the Entre Rios and Argentine North Eastern Railways.



of the standard or any falling off in transport efficiency. To show that the lessons in economy learned from the 1932 depression have not been lost sight of, a comparison with 1929, the best year prior to the slump, indicates that an increase of railway revenue has been earned of £266,564 or 11 per cent., and the work done has increased by 118,565,637 ton-miles or 31 per cent., but at a reduced cost of £183,792.

The progress system in the locomotive workshops continued to function in an entirely satisfactory manner, and engine mileage between general repairs again showed a gratifying increase. Six new Beyer-Garratt locomotives, with 54-in. diameter driving wheels, as against the present 43 in., are expected to be delivered early in 1939. Three diesel railcars are on indent for experimental purpose. They will be tried, in the first place, on the Kampala—Jinja section, where the density of the population promises good results. An agreement with the Tanganyika Railways and Port Services for pooling revenue from traffic with Tanganyika lake ports was in operation throughout 1937.

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### The Canadian Railways

THE special committee appointed by the Canadian Senate to "enquire into and report upon the best means of relieving the country from its extremely serious railway condition and financial burden consequent thereto," has adopted a brief report to the effect that it has been unable, in the time at its disposal, to analyse the vast mass of material submitted in such a way as would justify it in making any definite recommendation. It suggests that the committee be reconstructed during the next session of Parliament, and meanwhile urges the two railway administrations to redouble their efforts to effect economies by further co-operation. We publish in this issue abstracts of the submissions presented to the committee by the Presidents of the two great systems, that of Sir Edward Beatty for the Canadian Pacific Railway Company and that of Mr. S. J. Hungerford for the Canadian National Railways. Briefly stated, Sir Edward Beatty strongly recommends a solution in the form of a "unification" of the two systems, under which, while no change would be made in ownership or in the capital invested, the management of the whole would be confided to the Canadian Pacific Company. He states that the savings to be obtained from such an amalgamation or unification, are calculated to amount to some \$75,000,000 per annum. Mr. Hungerford, in his submission, strongly contests Sir Edward Beatty's conclusions. He questions the value of an estimate based on the results of eight years ago, and arrived at by applying to one system the statistical units of another. Moreover, a large proportion of the savings are contingent on the closing of 5,000 miles of unremunerative lines, and Mr. Hungerford says that the country would not stand for this. He maintains that the Canadian National Railways are playing a vital part in the development of the Dominion, and the service so rendered is not and cannot be a matter of profit and balance sheets.

The proposals for unification are not new. The Royal Commission on Transportation of 1931 and 1932 examined the question but rejected unification in favour of a policy of enforced co-operation. Some measure of co-operation has been achieved, but its results on the whole have been disappointing. Sir Edward Beatty says this is inevitable, as co-operation at its best will not compensate for expensive overlapping and parallel services; nor can it meet the problem of unremunerative lines, which represent for the nation a very heavy annual tribute. Mr. Hungerford, however, believes that co-operation has not had a fair

chance and that if it were freed of the atmosphere created by the unification proposals greater economies could still be made. The National system, in its present form, could and would show very much improved earnings. It had never failed since 1923 to meet its operating expenses, and during years of prosperity it earned also the interest charges. There is an assumption by the advocates of unification that Canada has too much railway mileage and that 5,000 miles of track should be torn up or abandoned, but the mere suggestion has apparently aroused a storm of protest. Certainly, as we pointed out in these columns on January 21 of the present year, the Dominion has an exceptionally extensive network of railways. The actual mileage is 42,270 miles, of which the Canadian National Railways accounts for 23,684 miles and the Canadian Pacific for 17,223 miles. The question of railways in Canada will recall to the older generation of railway investors in Great Britain the fate of the Grand Trunk Company and the sequence of legal proceedings and arbitrations which continued long after the line was merged in 1923 with the present National system. It is not clear to what extent the difficulties which have given rise to the present controversial issue may have been a legacy from the earlier period, and it is not easy to judge at this distance of the true merits of either side, but it does seem that one of the principal factors in the case is the burden of financial obligations which the National system is unable to meet, and which will constitute the main problem to be considered by the Senate Committee when it reassembles. Meanwhile, the Ottawa Parliament has substituted for the present Railway Commission a Transport Board whose authority will embrace not only railways but water and air transport.

\* \* \* \*

### British Railways in War

THE increasing pre-occupation of the world with the possibility of war, makes of topical interest the part to be played by railways should such a catastrophe overwhelm us. The report of the Home Office Committee, under the chairmanship of Sir John Anderson, is expected shortly, and Mr. Geoffrey Lloyd's recent revelation that railway timetables have been worked out for the removal of 3,500,000 people from London in 72 hours has led to a good deal of speculation as to how such a feat can be achieved. It is conceivable that one of the first effects of war would be to put out of action as many sources of power as possible. Not long ago Mr. A. P. Herbert had an article in *Punch* which deserved, and it may be hoped received, due consideration in more serious quarters. It described with all the vividness of Mr. Herbert's pen the tremendous concentration of power on the Thames, and gave a picture of how quickly and extensively London might be paralysed as a result of attack from the air. Any scheme of evacuation that did not take into account the probability of the paralysis of our electric railways would not inspire much confidence. Should it be possible to maintain the supply of electric power, the London deep-level tubes would be an extraordinarily efficient method of evacuating large masses of people to the outskirts. Without power, however, they would be useless, and the question immediately comes to mind as to the installation of emergency power stations at a number of strategic points should serious damage to central power stations and interference with transmission lines even temporarily interrupt adequate supply at a critical moment.

The problem of the surface railway is quite different. If power were cut off from the Southern Railway, and assuming that damage to the permanent way could be overtaken by emergency flying squads of permanent way

men, it should be possible to haul by means of steam locomotives the electric trains with their high passenger-carrying capacity, and this raises the problem of the provision of suitable engine power. Both the L.M.S.R. and the Great Western have in their mixed traffic 4-6-0 standard locomotives types that could be run almost anywhere in the country. Their overall dimensions are moderate and their axle loads comparatively light, yet they are highly efficient machines of simple design and construction and capable of being handled by comparatively unskilled men. Besides the principal locomotive works of these railways, several locomotive manufacturers in this country are capable of turning out quantities of such locomotives on mass production lines, and it would seem to be a feasible proposition that immediately an emergency arose, or was deemed imminent, orders for these standard locomotives should be placed. They could then be drafted to whatever part of the country motive power was most urgently required, including the Southern Railway for the purpose of hauling electric trains where the current was cut off.

Signalling is another matter for which plans are probably already well advanced, and the training of emergency staff in hand signalling should power and colour-light signalling be interrupted is a measure of some importance. The control of increasingly large areas from one signal

box, facilitated by the development of power signalling, has been criticised as greatly extending the interference with working should a box be badly damaged from the air. That great inconvenience would be caused needs no emphasis. The recent fire at the Johannesburg signal box affords an example. Hand cranking of points at an important centre is bound to absorb considerable time, while in war conditions the renewal of equipment would be very difficult. The former Eastern Railway of France therefore installed at all new power interlockings a reserve set of operating handles in a separate shelter removed from the signal box, from which points can still be set electrically if the main apparatus is disturbed. At very large locations these reserve control shelters are spread over the area to limit risks still further, each controlling a group of appliances on the track.

The amount of truth in the rumour generally current during past wars, that the enemy would never deliberately destroy staff headquarters, is a matter of speculation, but it would be unwise to underestimate the risk in the uncertain conditions of future wars. Therefore, the greatest possible preliminary measures of decentralisation should be encouraged so that, in the event of a centre of direction ceasing to function, those on the ground may have a sense of initiative already well enough developed to cause them to do their utmost without specific instruction.

## LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

### An Argentine Historical Link

"Greylands," 116, Queen Anne Avenue,  
Bromley, Kent  
July 6

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—A few days before leaving the Argentine, I noticed in the *Buenos Aires Herald* for June 1 last the following obituary notice which perhaps may interest you sufficiently for publication in your paper, which as a railwayman I always find interesting:—

"A link with the past disappeared on Monday night (May 30) with the death of Mr. James Lawrie Allan, the only son of Mr. Thomas Allan, who drove *La Porteña* the first locomotive to arrive in Argentina. Mr. Allan (Jr.) was also the first telegraph operator in the Province of Buenos Aires, and inaugurated a number of telegraph offices. For several years past he lived in the town of San Vicente and he passed away at the age of 75, leaving nine sons and daughters.

"Messrs. Thomas and John Allan were brought to Argentina under contract with the predecessor of the Western Railway, which at that time ran from Parque station (Plaza Lavalle) to Floresta (Velez Sarsfield). They drove the *La Porteña* engine (which was first used in the Crimean war) on its first trip (1857) and it was a short time afterwards that they accepted a challenge from a "gaucho" to a species of tug-of-war, with the engine pulling in one direction and a large bay horse in the other. Spectators were astounded to see the horse get the better of the struggle at first, but after dragging the engine backwards for the space of a good few yards the horse started to lose ground, and finally the rope snapped in two and the engine steamed merrily away. It was afterwards revealed that the Allan brothers had driven the engine backwards at first, so as to give the challenger a run for his money."

The *La Porteña* locomotive mentioned was intended for the Crimea, but it was sent out to the Argentine, and this to a certain extent may account for the present 5 ft. 6 in. gauge there. The Parque station was at that date on the outskirts of Buenos Aires, and is today occupied by the Colon opera house, right in the heart of the city. Floresta station, today Velez Sarsfield, is the third station from Once, the terminal station of the Buenos Ayres Western Railway, and is well within the city, but at the time mentioned it was right in the country, only some 7 km. from Once station. The portion of line mentioned was the precursor of the Provincial Railway, which eventually was extended to

Trenque Lauquen some 444 km. from Buenos Aires. This line was later incorporated in, or rather handed over to, the Buenos Ayres Western Railway Company, which today has a mileage of some 3,000 odd kilometres. The *La Porteña* locomotive is now kept in the museum at Lujan, a cathedral town 61 km. west of Buenos Aires.

Yours faithfully,

P. H. TIMMINS

[The railway gauge in Russia is, of course, 5 ft. During the Crimean war 5 ft. 6 in.-gauge railway equipment was adopted by the British forces in view of the Indian railway stores available. *La Porteña* was intended for British war service in the Crimea, not for use on the ordinary Russian railways.—Ed. R.G.]

### Second Class to Scotland

Northwood, Middlesex,  
July 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—May I congratulate you on the splendid photographs of the revived "Special Scotch Express" reproduced in your issue of July 8? I give the name of the train as given in *Bradshaw* of August, 1888. Page 69 of your issue shows the make up of the train as seating 80 first class and 90 third class passengers. What about second class? The 10 o'clock a.m. from King's Cross was primarily for first and second class passengers only. The *Bradshaws* of the period head the column "1 and 2" but with this note, "3rd class from London (Victoria, L.C. & D., Moorgate Street, King's Cross, and Finsbury Park) to Edinbro', Glasgow, and stas. North and West of Edinbro'; also from Broad Street (N.L.) to Edinbro'." It was only since November, 1887, that third class passengers had been conveyed by the train. Acworth's "Railways of England," 5th Edition, p. 223, reproduces a G.N.R. working circular of August, 1888, describing the Edinburgh portion as special 1, 2, 3 class Day Express. I often saw the train run through Hatfield fifty years ago, but I did not see the recent reproduction. Is it possible that the L.N.E.R. committed such an anachronism as not to show second class?

Your Obedient Servant,

REGINALD B. FELLOWS

## PUBLICATIONS RECEIVED

**The Brunels, Father and Son.** By Celia Brunel Noble. London: R. Cobden-Sanderson Limited, 1, Montague Street, W.C.1. 9 in. x 5½ in. x 1½ in. 279 pp. Illustrated. Price 15s. net.—From the British engineering viewpoint one of the benefits which Great Britain received as the result of the French Revolution was the adoption by Marc Isambard Brunel of England as his home. In consequence it was here that he exercised his own great talents in the early years of civil engineering and also it was here that his even greater son—Isambard Kingdom Brunel—performed engineering feats which have resulted in the inclusion of his name among the immortals of the profession. Lady Noble set out with the peculiar facilities for access to family records afforded her by her relationship to the Brunels as great-granddaughter of one and granddaughter of the other. She has, therefore, prepared what purports to be a representation of her two distinguished ancestors as living characters and has achieved her object admirably. In the first page she gives us a vivid picture of the scene at the village of Hacqueville, Normandy, which had been farmed for centuries by "Messieurs Brunel, Cultivateurs," when Marc Isambard, a second son, first saw the light on April 25, 1769. His mathematical and engineering leanings proved a source of constant disappointment to his father, and after stern discipline had failed to induce young Marc to take the slightest interest in the possibilities of the priesthood, his father gave a grudging consent to the adoption of a naval career, but so grudging that he even refused to say "good-bye." While the French Revolution was at its height Marc worked for a time in America, and even competed successfully with a design for a new Congress building at Washington, although motives of economy prevented the structure being built to his plans. He came to England at the beginning of 1799 and it is from this point that his well-known engineering career really starts. Of course, the Thames Tunnel looms largely in succeeding chapters, and Lady Noble has successfully blended the personal and the business sides of the enterprise, so that we see this great achievement not as a cold engineering project but as the day-to-day work of a very human man.

Similarly, Part II which deals with the career of Isambard Kingdom Brunel gives us the story of the man, and the development of the Great Western Railway and of his steamship enterprises are seen through the eyes of their constructor. It is not common to find the son of an illustrious father himself becoming illustrious in the same line, but it is exceedingly rare to find both at work simultaneously upon separate and important undertakings, and both regarding the other's expert opinion as the best obtainable.

To railway readers familiar with the originality of Isambard's work it may come as a surprise to find the author concludes that Marc's mind was the more original and inventive, whereas Isambard took the inventions of other men where he found them but enlarged them to a scale of magnitude that amazed their projectors. Marc is described as the pure engineer trying to give people what they wanted at the time; and Isambard as the one who looked so far ahead that he gave people what he expected them to want later. Lady Noble has performed a worthy work in presenting this vivid picture of two remarkable pioneers in the early engineering world, and, far from experiencing what she describes in her foreword as "disappointment that the creations of the Brunels should be seen only through the medium of a woman's non-mechanical mind," we have no doubt readers will be grateful to her for clothing the cold story of achievement with the flesh and life-blood of character and personality such as only a member of the family could do.

**Where Do We Go From Here?**

Planned and edited by Joseph Mayers and Bernard Spiers. London: Frederick Muller Limited, 29, Great James Street, W.C.1. 8½ in. x 5½ in. 271 pp. Price 8s. 6d. net.—To provide an adequate answer to the question "Where do we go from here?" it is necessary first to decide where we want to go, and then to examine present tendencies to find out how far we are on the right road and what advances thereon are being made. Without a clearly defined, agreed objective, there cannot be progress, and it is just the lack of any such aim that causes the peoples of the world today to drift aimlessly—and dangerously. If we were still capable of surprise, we should regard it as odd that a book with this title should not, as a book, specify or even suggest any particular objective. Dr. H. G. Stead, who contributes the chapter "Education at the Cross-Roads," to this symposium, appreciates this and says that to answer the question fully would involve preliminary discussions of two other questions—Where *can* we go from here and where do we *want* to go from here? He also points out quite truly that, if there are alternative routes open to us, the choice of which route we follow depends upon our wills. As a study, however, this clear thinking is lacking in the volume under notice, and we are left with the impression of a rudderless ship drifting in a mine-strewn sea with the crew doing nothing better than holding a debate. That is not to say the debate is not entertaining. With a list of contributors containing such names as Sir Follett Holt, Alexander Korda, Prof. A. M. Low, Sir Harold Bellman, Prunella Stack, Caroline Haslett, and Stanley Lief (mis-spelt Leif), the reader can be sure of pleasant instruction. The sub-

jects are sufficiently indicated by the chapter headings as follow: Advertising, publicity and propaganda; the immediate problems of commercial aviation; Diet—its relation to health and disease; Education at the cross-roads; Electricity—tomorrow's handmaid; National fitness; Housing and housing problems; The future of the Press; Towards a rational medical profession; The attack on noise; The status of the film today and tomorrow; Television—the newest marvel; A return to the theatre of ideas; Transport's seven-league boots. Sir Follett Holt's contribution on transport is discussed in an editorial article on page 108. But, at the end of it all, the reader remains with his doubts unresolved, for the sole reason that the question should not need to be asked in any civilised community. No association of people can achieve anything as a community unless the objective of that association has, from the outset, a clear and well-understood objective. Given that, the question that is important is "How do we get there?"

**Universal Directory of Railway Officials and Railway Year Book, 1938-39.**

London: The Directory Publishing Co. Ltd., 33, Tothill Street, Westminster, S.W.1. 604 pp. 6 in. by 9 in. by 1½ in. Price 20s. net.—The latest available financial results; the route mileage, numbers of locomotives, carriages, wagons, and railcars of the world's leading railways; numbers of men employed on the home railways in specified grades; the world's railway speed records; and the dates of opening of early railways; are only a small selection from the hundreds of items, which, in addition to a thoroughly comprehensive directory of chief and departmental heads of practically every railway in the world, are contained in the 600-page volume forming the forty-fourth annual edition of this railway *vade mecum*. The past year has been one of change so far as many foreign administrations are concerned, and the carefully set out officially-supplied full details of the amalgamated French railway system provide an example of the up-to-dateness of the new edition, which is similarly reflected in the care taken to give the latest available figures in the large statistical section of the book. Railway users of the directory will appreciate the retention of the same order for the various railways as in recent editions, in which home railway entries are followed by those for the British Colonial Empire, the Dominions, South America, Europe, Asia, U.S.A., and Central America.

**Colliery Lighting System.**

British Insulated Cables Limited, of Prescott, Lancs, has published an illustrated catalogue describing the B.I. colliery lighting system. This system uses cables of the round twin type, C.M.A. 250-volt grade, adequately protected by worming, arming, and serving. The fittings are well-designed and of robust construction, and carry the Mines Departments' Buxton Certificate.



## THE SCRAP HEAP

Because handwriting so often fails to distinguish between m's and w's, there is no longer a Meeks, Saskatchewan, on Canadian Post Office lists. Too many letters intended for Weeks, Sask., went to Meeks, a point on the Canadian National Railways. The latter has now become Armit, the name of a lake and river in the district.

While closing the doors of the 6.47 p.m. Metropolitan Line train from Baker Street to Uxbridge recently, one of the porters dropped his wrist watch, which had a faulty strap, and it was carried away on the footboard. A telephone message was sent to Harrow, where the station staff met the train, found the watch—it was still ticking away merrily—and restored it to the owner.

The L.N.E.R. has just initiated a service at King's Cross and Liverpool Street stations for the sale of fresh fruits to passengers on departing trains. Smartly uniformed girls carrying a tray containing fruit are to be in attendance on the platforms, so that passengers may have the opportunity of purchasing choice refreshment of this type for the journey. These "fruit girls" will supplement the service given by the platform trolleys which supply more solid refreshments.

### A SOUTHERN DIRGE

Tune: *The Wheel of the Wagon*  
The wheel of the engine is broken,  
And there's weeds round the steam-shed door;  
The wheel of the engine is broken,  
And it ain't goin' to turn no more!

Electrics are running to Pompey,  
To Brighton and Wor-thing too,  
To Lewes, Eastbourne, and Hastings,  
For the days of steam are through.

The old green engine is broken up,  
Though I heard a man complain  
That the juice-wagon knocks the road  
about

Far more than the good steam train.

There's only a dead-man's-handle,  
For the regulator has gone  
To regulate a ghost train  
On the line to Erewon!

The wheel of the engine is broken,  
And there's grass where the coal-stack  
stood.

The wheel of the engine is broken,  
Her pressure's gone down for good.

Good-bye, Old Faithful!  
You've met your Waterloo!  
Good-bye, Old Faithful!  
The days of steam are through!

C. HAMILTON ELLIS  
(With apologies to the Hill-Billies.)

THE STORY OF A LOCOMOTIVE BELL  
An American locomotive bell which formerly summoned to work the engine fitters at Hornsey locomotive depot, L.N.E.R., has just retired from service and a home has been found for it by a member of the American Embassy staff. This bell has a curious history. It was mounted on the 5,000th engine built by the Baldwin Locomotive Works, U.S.A., in 1880, which was intended for fast passenger service between Philadelphia and Jersey City on the Philadelphia & Reading Railroad. This engine was purchased complete by Mr. Lovatt Eames, an American inventor, in order to demonstrate the efficiency of a vacuum brake he had invented. In 1881 Mr. Eames shipped the locomotive to England and it was re-assembled at the Lancashire & Yorkshire Railway works at Miles Platting early the next year. There was an ex-

hibition of life-saving appliances at Alexandra Palace in July and Mr. Eames, considering that his vacuum brake came under that category, had the engine displayed there. After the exhibition it was stabled at the Great Northern Railway shed at Wood Green, from where it made occasional demonstration trips. It had a short life, however, for on April 24, 1884, it was sold to a scrap merchant who broke it up where it stood, but the engine bell was retrieved and preserved for many years at King's Cross locomotive depot. Removed to Hornsey when the new engine shed was built there, it served as a time signal for the fitters employed at that depot. Its active service completed, it was recently handed over by Sir Nigel Gresley on behalf of the L.N.E.R. to Mr. Richard Pennoyer who is attached to the American Embassy.

The train waved goodbye with its great white smoke handkerchief.—  
From "The Readers Digest" of June, 1938.

**SEE HOW THEY RUN**

From **LITTLEHAMPTON**  
Commencing July 3rd, 1938

WEEKDAYS											
STATION	7.15	7.45	8.15	8.45	9.15	9.45	10.15	10.45	11.15	11.45	12.15
5											
6											
10											
12											
4											
7											
9											
12											
3											
7											
10											
11											
12											
SUNDAYS											
STATION	7.15	7.45	8.15	8.45	9.15	9.45	10.15	10.45	11.15	11.45	12.15
7											
10											
2											
5											
8											
10											
1											
5											
8											
11											
12											

**SOUTHERN ELECTRIC**

Reduced reproduction of a new Southern Railway double royal poster with a real railway flavour. It also brings in the initials of the company in a clever way

## OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

### INDIA

#### Popularity of Air-Conditioned Coaches

An examination of the bookings in the air-conditioned coaches provided on the mail train services between Calcutta and Bombay, and between Bombay and Delhi reveals the growing, if seasonal, popularity of this luxurious form of travel. The Frontier Mail between Bombay and Delhi includes one of these coaches with 14 berths on four days in the week, and on the Calcutta—Bombay route via the E.I.R., an air-conditioned coach is attached to the daily mail train service. The number of passengers who used this amenity since January last is as follows :—

Month	Bombay—Delhi Service		Calcutta—Bombay Service	
	From Bombay	From Delhi	From Bombay	From Calcutta
January ..	35	35	113	173
February ..	33	32	92	156
March ..	62	48	125	320
April ..	79	73	166	315
May 1 to 20	—	—	98	259

It has been ascertained that on several occasions during March and April the demand for reservations on the air-conditioned coaches far exceeded the limited accommodation available, in spite of the fact that a surcharge of one rupee for every 50 miles or part thereof is levied on this service. There is reason to believe that the majority of passengers who take advantage of this amenity are either proceeding to or returning from Europe. It may be found profitable for the Indian railway authorities to institute a more certain test of the demand for air-conditioned coaches in the country by the equipment of a limited number of lower class carriages with this modern amenity.

#### Railway Accounts and Audit

The annual conference of the Institute of Railway Accountants and Auditors opened at Calcutta on June 20 with Mr. V. Iyer, Chief Auditor and Accountant, Madras and Southern Maharashtra Railway, in the chair. In his presidential address, Mr. Iyer dealt at length with various technical points relating to the Depreciation Fund. Referring to the position of the audit under the new Government of India Act, Mr. Iyer said that the instructions in the Act were very brief and everything lay in the amount of wisdom and foresight with which the necessary arrangements were made.

#### Relation between Audit and Other Departments

Mr. A. F. Harvey, Agent of the Eastern Bengal Railway and President of the Indian Railway Conference Association addressed the institute, choosing as his theme the relations between the Audit and Accounts Departments and other departments. Prior to the separation of audit and accounts on State-managed

railways, the Audit Department carried out the dual functions of the preparation and audit of railway accounts. The duties of the auditor, necessarily critical, did not inspire much enthusiasm in the departments he criticised and reported upon, and the unhappy relations continued to exist when the work of the Chief Auditor came to be restricted to statutory audit. The departments were, therefore, inclined to look upon the Chief Auditor as a statutory enemy. The Accounts Department, however, as an integral part of the railway administration, stood on a different footing and could assist the departments in the supervision and control of expenditure, so that the "statutory enemy" could find nothing to criticise. Mr. Harvey wished to see closer co-operation between the accounts and other departments of a railway administration, and appealed to the accounts officers to endeavour to promote confidence and goodwill and to remove a feeling that was still prevalent in other departments that the accounts people, when they came to inspect an office, were out to find fault. He suggested from his own experience that a more temperate wording of inspection notes by accounts officers would have the desired effect.

#### Mechanisation of Accounts Offices

Among the many interesting papers on railway accounts and finance that were read and discussed at the conference were some relating to the introduction of mechanical appliances in accountancy and in stores accounts. The delegates paid a visit to the Eastern Bengal Railway statistical office to examine the working of the machines installed there. In the discussion on the subject of mechanisation, the case for and against machines was thrashed out at length. The President closed the debate with the remark that mechanisation was justified in cases where the material was uniform and the volume of work considerable. Moreover, every scheme for mechanisation must be financially justified and any claim for improvement of efficiency must be reflected in tangible economy.

#### Industrial Development in Relation to Railways

Mr. C. A. Crawford, Deputy Commercial Manager, East Indian Railway, also delivered an interesting lecture on "Some Aspects of Industrial Development in India in Relation to Railways." After reviewing the growth of protected and numerous other industries, the speaker pointed out that these developments had affected differently the various railways; some had gained considerably, while others had suffered loss. Again, the concentration of industry at Tatanagar and in the vicinity of Asansol produced entirely different results from those, say, of the widely

distributed small units comprising the sugar industry over a vast area in northern India.

The transportation of imported manufactures from the ports to consuming centres constituted a large and remunerative traffic bearing relatively high rates. On the other hand, local manufacture, apart from affecting this flow, gave rise to many transportation problems, such as the transport of raw materials, the manufactured article, and the by-products. Specially reduced rates had to be given for the transport of raw materials and by-products. Manufactured articles formerly imported had largely or wholly been replaced by Indian products, such as matches, cloth, cement, sugar, paper, iron and steel, and so on. The growth and development of the manufacturing industries had led to a contraction in the volume of raw materials and primary products to the ports, and had introduced traffic in manufactured articles in the reverse direction. The railways shared in the economic benefit accruing to the country from this industrialisation, and had, therefore, had to identify themselves intimately with the fortunes of individual industries. Mr. Crawford finally refuted the criticism often put forward of unfair discrimination against indigenous manufactures in the matter of railway rates.

The President and delegates at the conference were taken on a demonstration run in an air-conditioned coach from Howrah to Bandel and back.

### UNITED STATES

#### Amalgamation Set-Back

While there has been talk for years in America about solving the railway riddle by amalgamation and the suppression of excessively competitive services, it is apparent that the constituted authorities are so far not in favour of this solution. This was revealed recently in a decision by the Interstate Commerce Commission in which it refused to permit the dismemberment of the Minneapolis & St. Louis and its partition among neighbouring larger railroads. The Minneapolis & St. Louis barely earned enough to pay its operating expenses even before the economic crisis, and the Northwestern area it serves already has a plethora of competing railways.

The commission did not deny that the partition of the Minneapolis & St. Louis would improve the status of the sorely-pressed railways in the Northwest, but it found that the proposal would involve the abandonment of 300 miles of line, leaving a number of small communities without railway service, and would result in the dismissal of 2,000 employees, hence, the dismemberment should not be permitted. In other words, the Interstate Commerce Commission takes the view that the railways are not to operate primarily for the purpose of earning money for investors, but solely to give service to the public and jobs to

employees. How long an industry can continue to function as a private enterprise, when any return at all to capital is a consideration no longer seriously entertained, is the question now uppermost in the minds of most observers of the chaotic transport scene.

## SOUTH AFRICA

### Provision of Hostels

In addition to its house-ownership schemes [last referred to in these columns in our issue of March 25.—*Ed. R.G.*], the administration is continuing its policy of providing hostels at the principal railway centres for the accommodation of lower-paid unmarried members of its staff. Nine such hostels have already been erected providing single room accommodation for close on 1,200 inmates, and the tenth building is nearing completion. For accommodation in the hostels a nominal monthly rental is charged, and food is supplied on a communal mess basis under the supervision of a domestic committee.

### Airways Developments

The rapid and steady growth in the air traffic of the Union has made South African Airways one of the largest air services south of the equator. Larger machines, more frequent services, and freedom from accident have won the confidence of the public. Earnings passed the £4,000 mark for the first time in the week ended February 26 last, but since then that figure has been exceeded several times. One of the chief factors in increasing the passenger traffic appears to have been the provision of larger planes with three engines. In the middle of 1937 there were only four J.U. 52's, 18 J.U. 86's, and two of the J.U. 90's, which will take 30 to 40 passengers each.

The increase in the frequency of the services has led to a great increase in the mail traffic quite apart from the inauguration last year of the "all air" service for first class mail matter.

Augmenting the airways fleet has enabled the administration to put extra machines on any route where the traffic is heavy. Thus unrestricted bookings can be undertaken, and the businessman can make a habit of flying and the holidaymaker is always sure of a seat.

## LATVIA

### State Railways Expansion

During recent years there has been a considerable extension of the State Railways system in various directions, and particularly in so far as the 5-ft. 0-in. gauge section is concerned. The two most important lines that have been undertaken are those from Riga to Rujiena in the north, completed in December last [as recorded in our issue of May 27—*Ed. R.G.*], and to Karsava, near the U.S.S.R. frontier, to the east. The latter line is still under construction, for though the Riga-Suntazi (34 miles) and Madona-Lubana (12½ miles)

sections were opened in 1935, those between Suntazi and Madona, and Lubana and Karsava are not yet completed. When this route is open, Riga will be the centre of a remarkable system of direct radiating broad-gauge lines to the north, north-east, east (two), south-east, south-west, and north-west. To the south-west also runs the standard gauge section to Lithuania via Jelgava. [See sketch map below—*Ed. R.G.*]

West of Riga an important link between Tukums and Kuldija has been surveyed. If constructed, this line will form part of an alternative route between the capital and the important port of Liepaja, the existing broad gauge connection between these points being further south via Jelgava. As the Kuldiga-Liepaja section is at present of 2-ft. 6-in. gauge, this will have to be converted to broad gauge if the projected line is to be of that gauge in order to provide a through 5-ft. gauge route.

### Locomotive Stock

The locomotive stock in service on March 31, 1937, was as under:—

Type	Gauge				
	5-ft.	4-ft. 8½-in.	2-ft. 6-in.	1-ft. 11½-in.	Total
2-2-2 ..	20*	—	—	—	20
4-4-0 ..	—	9	—	—	9
2-4-2 ..	3†	—	—	—	3
0-6-0 ..	1	1	—	—	2
2-6-0 ..	21	11	—	—	32
4-6-0 (A) ..	12	—	—	—	12
4-6-0 (C) ..	15	—	—	—	15
2-6-2 (Ct) ..	7†	—	—	—	7
2-6-2 (C) ..	9	—	—	—	9
0-8-0 ..	83	5	5	66	159
2-8-0 ..	6	1	13	—	20
2-10-0 ..	—	—	2	—	2
	177	27	20	66	290

\* Three converted to 4 ft. 8½ in.

† One converted to 4-ft. 8½-in. gauge.

The 2-2-2 tank engines are used for light shuttle trains, and have proved popular and efficient. [They were illustrated and described in our issues of July 8 and August 12, 1932—*Ed. R.G.*] Some were built in Germany and others

in the railway shops, and eight have wheels and motion designed so as to be convertible from 5-ft. to 4-ft. 8½-in. gauge.

### Rolling Stock

The following railcar, carriage, and wagon stocks are in service:—

Type	Gauge				
	5-ft.	4-ft. 8½-in.	2-ft. 6-in.	1-ft. 11½-in.	Total
Coaches ..	548	104	43	63	758
Baggage vans ..	38	10	10	—	58
Mail vans ..	13	3	2	8	26
Service vans ..	15	—	1	2	18
Special cars ..	26	—	1	—	27
Railcars ..	2	1	—	—	3
Wagons ..	4,260	479	195	960	5,894

Of the 5-ft. gauge railcars, one has a 100-h.p. diesel engine, and the other uses coal gas as its fuel. There is no first class coaching stock, but most carriages are electrically lit, though some still have only candles.

### Passenger and Goods Traffic

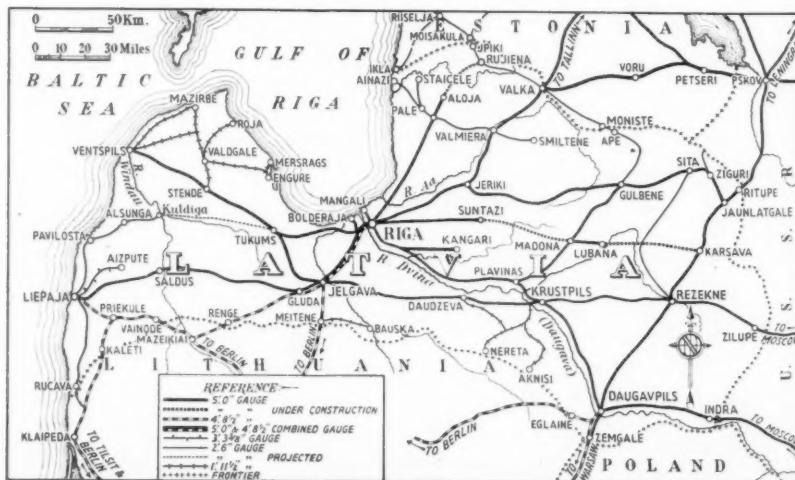
The following table shows the rising traffics handled during the past three completed financial years:—

	1934-35	1935-36	1936-37
Passengers ..	13,762,465	14,076,296	14,788,972
Tonnage (public)	3,173,000	3,142,584	3,405,139

### Financial Results

During the past four financial years receipts have risen steadily, but working expenses have not correspondingly increased, with the result that net earnings have multiplied nearly five times in this short period. The following are the figures year by year, in thousands of lats:—

Year	Receipts	Expenditure	Net earnings	Operating ratio (%)
1933-34	30,548	29,383	1,165	96.2
1934-35	33,234	29,339	3,895	88.0
1935-36	33,733	29,380	4,353	87.1
1936-37	36,965	30,950	5,015	86.1



Sketch map of Latvian railways showing latest extensions and projects



## THE CANADIAN RAILWAYS: UNIFICATION OR CO-OPERATION?

*Summary of statements by Sir Edward Beatty and Mr. S. J. Hungerford*

THE special railway committee appointed by the Canadian Senate to consider proposals for solving the railway problem has received the submissions of Sir Edward Beatty, Chairman and President of the Canadian Pacific Railway Company, and Mr. S. J. Hungerford, Chairman and President of the Canadian National Railways. The two documents are summarised as follow.

### SIR EDWARD BEATTY'S SUBMISSION

The original railway system in Canada was the Grand Trunk, a corporation financed in England. The Canadian Pacific was formed later, to undertake the rash adventure, declined by the Grand Trunk, of building a railway from Montreal to the mouth of the Fraser River. Fortunately the adventure proved one of modest profit. It was in 1917 that the Drayton-Acworth Commission recommended the amalgamation of the Canadian Northern, Grand Trunk, Grand Trunk Pacific, and Canadian Government Railways. The first formal suggestion of unified operation was made on behalf of the Canadian Pacific Railway by Lord Shaughnessy in 1921. Then in 1925 a Committee of the Senate was appointed to consider the question anew and recommendations for a merger were made, but a period of prosperity produced conditions in which the railway problem was forgotten. It ushered in the period in which Government authorised very large expenditure on its railway estimates. By 1931 the depression brought the problem up again, and a Royal Commission was appointed. The Royal Commission set aside the proposals for unification and recommended the establishment of a system providing for enforced co-operation between the companies. The Royal Commission did not condemn unification: its report was a compromise and it conveyed a warning to the people of Canada to the effect that the stability of the nation's finances and the financial credit of the Canadian Pacific would be threatened if the plan proposed or some equally effective measure were not adopted. It was at this point that the Canadian Pacific administration, after discussion with the late Sir Henry Thornton, offered the Royal Commission the suggestion which has come to be known as unification.

### Unification

The first essential point in the proposed unification is that the two railway companies shall continue to own their present properties. The securities of the companies would remain in their present ownership and no question of valuation or re-arrangement of capital is involved. Each group of owners would continue to receive a proportion of net earnings, based on past experience, while the savings would be equitably shared with the State. To prevent the unified entity from neglecting its duty as a public utility, the powers of the Board of Railway Commissioners might be increased. Adequate provision would be made for the rights of the railway workers. The advantages of unification are apparent. They include, first, relief for the national treasury. Secondly, unification would permit the Canadian Pacific to earn a fair return on prudently invested capital. Thirdly, the savings on unification would allow both companies to modernise and improve the public service. Fourthly, by stabilising the railway industry, the now imminent danger of forced abandonment of light traffic lines might be avoided, or at least lessened. And fifthly, unification would permit

the stabilisation of the employment of railway workers. Incidentally, surely all would welcome the removal of railway transportation from the political field, while at the same time a unified system would be better enabled to meet competition with other forms of transport.

### Estimated Savings

A committee of Canadian Pacific officers, after an exhaustive study, concluded that, given conditions similar to those of 1930, annual savings of \$75,000,000 could be realised by unification, and this was the estimate presented to the Royal Commission. Although the traffic volume is not the same in 1938 the estimate may be considered as reasonable and conservative. The item of the estimate which, although only involving a moderate amount of saving, has provoked most of the discussion, is that of line abandonment. It is desirable that this should be seen in its proper perspective. It is a question, not only of abandonment but of reduced cost of maintenance on one or two parallel lines. Another point is that the Royal Commission were informed that 30 to 35 millions could be saved by co-operation. Apart from reasons for the failure of co-operation the amount is only an earnest of the much greater saving obtainable by unification.

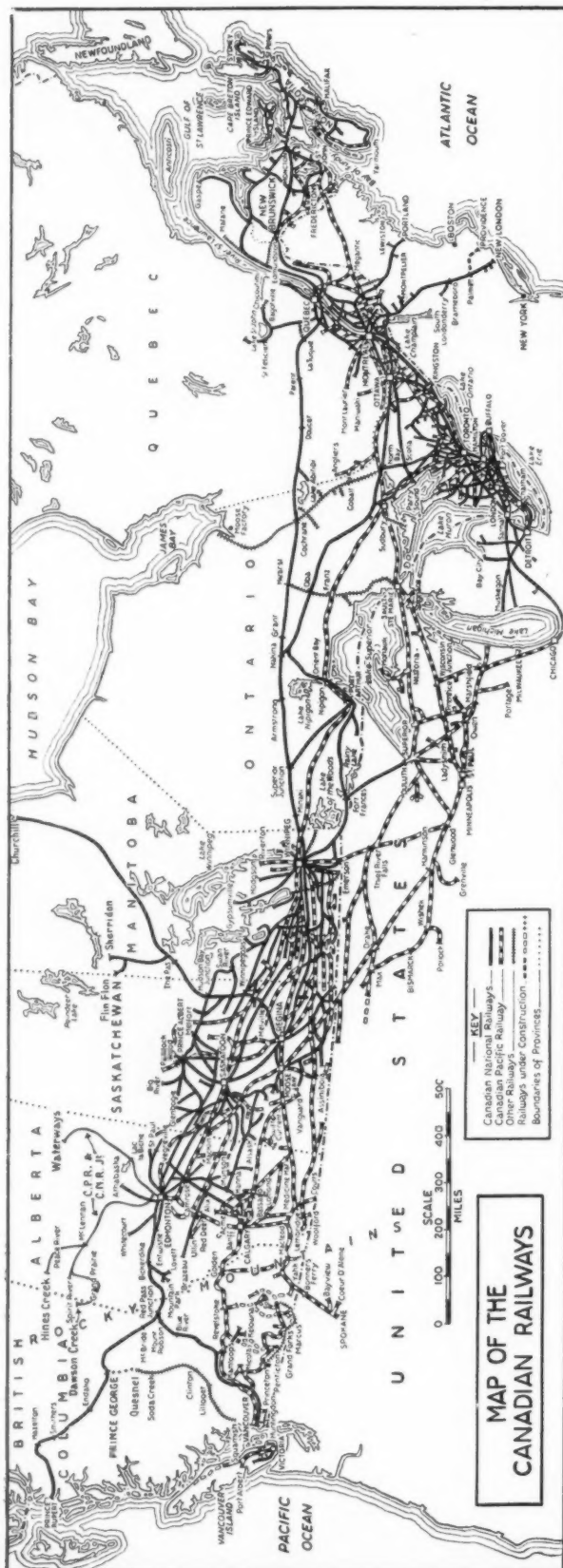
Up to the present there has been no alternative offered to unification, except co-operation. From the 1917 Commission onwards the statement has constantly been repeated that the day was approaching when the Canadian National Railways would cease to be a burden on the Canadian people. But with increased traffic the burden of debt has also increased and it does not seem that the forecast will ever be fulfilled under the present system.

### Difficulties of Co-operation

Unification, as the term is here used, is a plan by which the properties and services of the two railways will be entrusted to a single operating organisation. Co-operation, as recommended by the Royal Commission and made mandatory by the Act of 1933, is to be carried out by two competing companies, with independent administrations. Unification is a general plan, carried out throughout the railway. Co-operation is an attempt to build up individual projects of unification. The Canadian Pacific has taken seriously its obligations under the Act, but the results of such partial measures of co-operation as it has been possible to get authorised have been disappointing and the savings are not commensurate with the effort. It is not surprising that this should be so. It is a fact that the two great railway systems are competing for business and co-operation and competition scarcely seem suitable bedfellows. Each measure of co-operation in order to producing savings, seems to require the consolidation of other services and facilities. For instance the co-operative routing of trains into one or another station will accomplish minor savings but it may affect the choice by passengers of the route for future travel. Then, with all the goodwill, officers will not be able to agree in presenting joint schemes. The picture is also imaginable of two groups of salesmen engaged in competing with one another to obtain traffic to be carried in the same trains.

### Objections to Unification

Taking first the objection that unification would create a system beyond the ability of a board of directors and



management to conduct successfully, this would surely be simpler than for two administrations to do it simultaneously in co-operation. As for the objection that a monopoly would be created, a co-operative dual monopoly would not avoid the danger. The next objection is that unification would deprive communities of railway services, but with co-operation this would also be so. And as for the interests of the workers, they are already noting that co-operation for them is only unification in disguise, with the difference that all the supervisory officers are retained and the personnel savings are made entirely among the workers. Notwithstanding these considerations, the Canadian Pacific Railway has always been willing and eager to arrange co-operative measures; the difficulty has been to find where they could be effected.

### Freight Rates and Service

The idea that the existence of two railways keeps freight rates low is erroneous. Nor is it advisable to attempt to increase rates in order to maintain duplicate services. Freight rates are not the result of competition. They are set by the railway and are kept low by the railway managements, by their highly concentrated efforts to deal intelligently and consistently with a difficult problem. The same is largely true of standards of service. Thus, when air-conditioning became general, it was inevitable that it would be adopted in Canada, and neither competition nor an order of the Board of Railway Commissioners was needed to effect this important improvement. The volume of traffic is exposed to possible limitation from two factors among others. One is competition from other forms of transportation, not only that of the subsidised highway, but also the maritime freight transport of the Great Lakes and the Panama Canal. The other factor is one that is often forgotten. People will travel and ship goods only when the rates permit them to do so; if rates rise too high, business dries up.

### Public Control

Under unification the Canadian Government would continue to own the Canadian National Railways. Monopoly is a word that has a sinister significance to many people. In this case it is an argument obviously designed to frighten the public, but it loses much of its terror when it is considered that any monopoly would be strictly regulated by the public authority. Public opinion is a more potent influence than ever before, and the attitude of railway officers towards their public responsibility is drastically different from that of fifteen or twenty years ago. In any case, the powers of the Board of Railway Commissioners may be extended where necessary. The question of labour has already been referred to. The position of the workers will not suffer under unification. The annual turnover of labour on the Canadian Pacific is almost 5 per cent. The total saving of labour under unification are estimated at 15 to 17 per cent. Obviously, therefore, with five years required to accomplish unification, a policy of not hiring additional labour would reduce the staff more than the saving involves.

### Conclusion

Dealing with the subject in a broader fashion, it may be said that many of the objections to unification are merely objections to economic progress. This is not the first time that it has been sought to make economies in Canada by removing duplication. The amalgamation of the systems which now compose the Canadian National Railways differed radically from the unification now proposed, but the object of obtaining economy is the same in both cases.

"I have never welcomed unification," concludes Sir

Edward Beatty's brief. "The Canadian Pacific is a highly developed organisation and an object of pride to all its officers and employees. Under unification it will lose its identity—and that is a real loss to those of us who have spent a lifetime in its service. Even with the acute competition given it by what I consider has been an unwise venture of the State into the railway field, I still believe that the Canadian Pacific can survive as an independent institution. Far from eagerness, as my critics have it, to seize the publicly owned system, I feel deep regret that only by unification can we remove the greatest danger of which I know to the future of the nation. In a recent public address, I said that unification is inevitable. The public need compels it."

#### MR. S. J. HUNGERFORD'S SUBMISSION

The railway problem was examined by the Royal Commission on Transportation in 1931 and 1932, and after a very careful and searching inquiry into the merits of the proposal, unification was rejected and a policy of enforced co-operation was recommended. The conclusions arrived at by the Royal Commission are as sound today as they were in 1932. But the insistence by the Canadian Pacific Company on unification may have created an atmosphere which would make co-operation less effective than it might otherwise have been. The reiteration of one side of the case may have created an impression that there is no reasonable and logical answer to it, which is not correct. As a part of the advocacy of unification, the income deficits of the Canadian National Railways have been constantly stressed while there has been a continuing attack by self-styled experts and writers upon the Canadian National properties.

#### State Railways Not a Danger to Canada

The case submitted by the Canadian Pacific is that an unwise venture of the State into the railway field has produced the greatest danger to the future of the nation by the creation of the Canadian National Railways; that this danger can be removed only by unification; and that savings of \$75,000,000 a year would result. It cannot be agreed that the creation of the Canadian National Railways as a State owned and controlled public utility is a danger to Canada. Those who hold and express such views overlook the fact that public service demanded the continued operation of roads which found it impossible to continue operations on a profit basis. The public need for service existed and still exists and the only means of providing that service were the lines of railway now incorporated in the Canadian National system. If these lines render a needed public service, it is illogical not to expect a measure of financial encumbrance as a result of their continued operation in the public interest. The wisdom of the formation of the system cannot be judged solely from its financial results. There is a sounder justification for the operation of a public utility than railway profits, especially if as in this case that system is aiding in the development of the country. That the system has never since 1923 failed to meet its operating expenses, notwithstanding the great depression, and that during the years of prosperity it succeeded in earning its interest charges to the public, is a remarkable achievement, having regard to the condition of the properties when they were taken over by the Government.

#### Income Deficits Due to Burden of Interest

The income deficits of the Canadian National do not come out of the operation of the system but from the heavy burden of interest charges. The potential earning power of the system is very great and cannot be judged from any period in the past. As regards proposals for

reducing railway transportation costs, it must be said that the cost of railway operation in Canada, in relation to the work done and apart from interest on invested capital, is practically as low as in any country in the world at all comparable with the Dominion. Experience has shown that large scale economies are not produced by consolidations, and if there has been since 1923 a progressive improvement in efficiency, it is mostly the result of improvements in the art of railroading. It is probably more related to the competitive principle than to any other single factor.

#### Doubtful Estimated Savings

The Canadian Pacific have presented an estimate of \$75,000,000 a year as being the realisable economies from unification. These savings are based, first, on an assumption that the quantity of transportation service is greater, and the quality of such service is higher, than is needed. Secondly, the savings are based on the assumption that Canadian Pacific unit costs can be applied with propriety to Canadian National operations. Both assumptions are believed to be unsound. The Canadian Pacific placed line abandonments as the important initial step, with 5,000 miles, as a minimum and not as a maximum, the proportion of the total savings resulting from such abandonments being over \$16,000,000. It must be left to the judgment of the committee whether it would be in the best interests of the country to do this, and if it would not be setting the transportation clock of Canada back 30 years. The public interest is too much involved.

Much of the economy, based on other and undisclosed drastic changes, involving the abandonment of stations, roundhouses, terminals, shops, &c., and the degeneration of main into branch lines, if given a similar touch of reality by a disclosure of exactly what was contemplated, would likewise prove unsound and unrealisable. The insistence on abandonment may be taken as a faint warning of the attitude towards public service to be expected under unification. Most of the economies which are realisable in a practical sense, without impairing the public interest, can be obtained under the principle of co-operation without incurring all the unknown perils of unification.

Considering the possible effect on statistical averages of the differences between the maintenance and operating problems of the two systems, together with the narrow basis upon which the comparative costs are based, namely the single year 1930, it becomes apparent that this part of the estimate is a mere statistical conjecture. Moreover the policy, supported in Parliament, of maintaining at work all the railway staff for which legitimate employment could be found, rather than taking the drastic step of wholesale dismissals, naturally affected the 1930 basis of unit costs. But that the Canadian National is less efficient than the Canadian Pacific is most emphatically denied. While there is a superficial similarity between the two systems, there are wide differences between them as regards the property and the facilities to be maintained. The nature and the volume of traffic handled is also different, average density being less on the Canadian National. In any event, 1930 is now eight years gone, and figures so much out of date cannot safely be used to draw conclusions.

#### Financial Risks Involved in Unification

To sum up, it is judged that the asserted economies from unification or amalgamation are largely unrealisable. Railway savings obtained at the expense of the development of Canada and of a wide disturbance in the labour and material markets of the country would be too dearly obtained. The country instead of being better off would be worse off. Apart from the perils of monopoly, that there



are financial risks involved in unification cannot be gain-said. In the absence of knowledge of the exact terms of the proposed partnership between the State and private ownership, it would be idle to speculate on this aspect of unification, but it may be fitting to remark that a partnership between such diverse interests is liable to produce unforeseen problems which might conceivably involve the State to an extent never contemplated in the original contract. There would tend to be a conflict of interests between the public on one hand and private interests on the other.

#### Enforced Co-operation Best

These considerations are sufficient to justify a policy of enforced co-operation, and the only question is the best machinery for making that policy effective. If this Senate inquiry could dispose finally of unification as an alternative, and thereby dispel the unfavourable atmosphere under which co-operation has been attempted in the past five years, greater progress could be made in achieving co-operative economies in the future. A public body should be set up, consisting of three persons, one for each of the railway systems and a chairman representing the public interest. The reports of the body should be made public, and where public interest demands that a measure should be made effective, compulsion should be invoked through the medium of the arbitral tribunal provided for in the present Act.

#### Conclusion: The Future

In conclusion, the brief says, the difficulties of the railways are the direct result of the depression, and there is no magic remedy known for this fundamental situation. The records of Canada and her vast potentialities do not justify a policy of defeatism. The Canadian National has far greater potentialities than its principal rival, and the wealth of the northern territory is only just beginning to be realised. Canada has built railways somewhat in advance of her requirements, but the present situation of increased costs and decreased traffics is not necessarily a permanent condition. From all these points of view, the future may be viewed with a degree of confidence, and in the meantime the wise policy is to conserve the property.

#### C.P.R. SUBMISSIONS IN REPLY

In the submissions in reply, presented on June 22, 1938, Mr. Coleman, Vice-President, C.P.R., emphasised that the unification plan was not a plan evolved by the Canadian Pacific of its own initiative to obtain control of the Canadian National. It was originally prepared to conform with requests of a Royal Commission in 1931-32. There was also some misapprehension regarding the proposals. It is not a question of better administration; the whole point was that unification was a plan for using all the resources of two railways in the joint operation of a single system. As regards the estimate based on 1930 figures, the figure might now be reduced to slightly under 60 millions, and if no lines were abandoned, it might then be 10 per cent. less.

Sir Edward Beatty said he strongly dissented from the view that the Canadian Pacific was or would be less considerate of the public interest. It appeared from the criticisms of the Canadian National officers that they did not wish results to be measured by the yardstick of commercial enterprise. The facts are simply that co-operation can only produce very limited savings, while competition is maintained. The new plan of compulsory co-operation would not overcome the objections to unification. Moreover, there might be a very distinctive injustice to the Canadian Pacific Company. Clause 7 of the Canadian Pacific Charter imposes obligations in return for which the company holds certain rights. The principle of a tribunal on which the company would have only a minority representation would not be acceptable. As regards the precise terms under which the Canadian Pacific Company would enter into the proposed scheme and the assets to be included, with or without certain ancillary services, this would be a matter for discussion between the directors of the company and the Government. The final decision is for Parliament. The argument of the Canadian National officers seems to be to do nothing and wait for times to improve. That of the Canadian Pacific is to make saving now. Finally, Sir Edward Beatty suggested that the time had arrived when the whole question might be submitted for examination and report to a body of independent experts.

#### Amsler Planimeter

ALTHOUGH it is possible to determine the exact area of a plane surface by mathematical formulæ in very many instances, and even obtain the required figure from text book tables in numerous cases, the engineer is not infrequently faced with the problem of irregular figures whose areas must be ascertained by other means. There are various ways of achieving the desired end; in many of these instances it may be accomplished by sub-division of the main area and treatment sectionally on a mathematical basis, while others can be solved only by the use of one or other of the planimeters on the market.

An instrument which the writer has found useful in this direction is the Amsler No. 6. Although this is possibly one of the most widely used planimeters, strangely enough all users are apparently assumed to be equally expert at handling it, and this is certainly not so. Further, many operators appear to be conversant only with the position marked "10 sq. in." on the top surface of the square bar and as this permits only a very restricted movement of the arm, the full value of the device is rarely obtained.

For this reason the following table was drawn up and it will be observed that five different positions may be used to facilitate the use of the planimeter on drawings made to scales ranging from full size to a scale of  $\frac{1}{8}$ -in.

to 1 ft. This table, although it serves the purpose of the average engineering designer quite well, by no means exhausts the possibilities of this particular instrument, as no matter what scale a drawing may be made to, a suitable multiplier can be provided and added to the list here given.

TABLE OF MULTIPLIERS FOR DRAWINGS TO VARIOUS S CALES

Scale of Drawing	Scale to Use on Planimeter.	Multiplier to Use to Obtain	
		Sq. in.	Sq. ft.
Full size .. ..	10 sq. in. .. ..	10	0.0694
Half size .. ..	" .. ..	40	0.277
3 in. to 1 ft. .. ..	" .. ..	160	1.111
" .. ..	$\frac{3}{8}$ in. to 1 ft. .. ..	225	1.562
1 $\frac{1}{2}$ in. to 1 ft. .. ..	" .. ..	900	6.25
1 .. ..	" .. ..	1,800	12.5
$\frac{3}{4}$ .. ..	" .. ..	3,600	25
$\frac{1}{2}$ .. ..	" .. ..	7,200	50
$\frac{3}{8}$ .. ..	" .. ..	14,400	100
$\frac{1}{4}$ .. ..	" .. ..	14,400	100
$\frac{1}{8}$ .. ..	" .. ..	28,800	200
$\frac{1}{16}$ .. ..	" .. ..	115,200	800

## A UNIFIED COLONIAL RAILWAY SERVICE

*The case against unification as advocated in the article entitled "Notes on a Unified Colonial Railway Service," published on pages 923-4 in our issue of May 13 last*

*By A. DALTON, Acting Superintendent of the Line, Kenya and Uganda Railways and Harbours*

IT needs a fine imaginative gift on the part of your contributor on the above subject in your issue of May 13 to draw an analogy between the relationship which might exist between, say, the Gold Coast Railway, on the West Coast of Africa, and the Tanganyika Railways on the other side of that continent, and the relationship which exists between those parts of the home railway system formerly served by the Lancashire & Yorkshire Railway and the former London & North Western Railway. And it requires no small degree of courage to assert that this latter is the relationship which should, in a properly organised scheme of things, flourish between railways working under such varying conditions of climate, country, and race, and so separated by oceans and continents, as are the railways in the Colonies and Protectorates which sprawl across vast areas in different quarters of the globe.

### Curious Analogies and Similarities

Your contributor's opening argument, if I have understood it correctly, seems to be that, although it is quite comprehensible that local conditions governed the development of differing civil and mechanical engineering practice and operating arrangement, the linking up of communications through the medium of the air-mail no longer makes it necessary to take too much account of these local conditions; and the much overworked word "co-ordination" is invoked to shed a blessing on a scheme which would mould all Colonial railways into the same pattern. The present lack of uniformity is said to be regrettable. In recommending his scheme of "co-ordination," the experience of what is being done in India is cited, and it requires almost as much courage to draw this analogy as the other to which I have already referred.

Your correspondent, in reviewing colonial railways, draws attention to three fundamental similarities; the fact that they function in tropical countries, that European staff occupies supervisory posts only (incidentally, this is not true of the Kenya & Uganda Railways) and that this staff shares a common policy to train and utilise the services of the native peoples to an increasing extent. In the same fashion one could point to the similarity which exists between democratic and totalitarian governments in that they both endeavour to govern their respective countries. He makes no mention of the vast dissimilarities inherent in each of these factors. Take the racial question, for example—what points of similarity are there between railway work amongst the highly intelligent and educated inhabitants of Ceylon or the Federated Malay States, and those of Tanganyika, who are in a totally different stage of development?

That there is a great deal in common there is no denying, and more than that there is a great deal in common between all railways of all lands, however great their dissimilarities. But in no essential does the Ceylon Government Railway or the Federated Malay States Railways, with their totally different traffic conditions, parallel the African colonial railways in any manner which would make co-ordination or uniformity practicable. Apart from traffic conditions, the physical conditions of, say, the Federated Malay States Railways and the Kenya & Uganda Railways are so widely apart as to make co-

ordination ludicrous. The author of the article asks why do carriage designs differ? Surely there is every reason of climate why they should differ, apart from other important considerations of race, density, and length of average journey.

Transportation is the servant of the community, and as each Colony develops—as it will develop along lines peculiar to its particular conditions of climate, crops, people, and political views—so will its transportation system develop, and in its development it will be guided by the needs of the country rather than by the needs and experience of some other Colony developing on completely different lines many thousands of miles away.

In the administration of Colonial railways there is more than ever a need for flexibility of organisation. The existing form of control to my mind admirably provides this. While each railway is a self-contained unit, with the incentive of local enterprise engendered thereby, the Colonial Office and the Crown Agent provide media for the exchange of views. The annual report of each railway is closely studied by the others, and there is a regular exchange of correspondence between senior officers on various aspects of the work. I can see nothing but danger in any effort towards a greater degree of centralisation of control. As H. G. Wells points out, "It may easily be possible to carry the coalescence of business organisation too far. Points may be reached at which the advantages of economy are balanced by the difficulties of management and direction, and beyond these points there may be an increasing loss of vigour and effectiveness."

### Decentralisation Generally Advocated

In so far as railway organisation is concerned, experience shows that no sooner has amalgamation taken place—even in countries where connecting systems offer the maximum benefit—than we hear a chorus of senior officers singing the praises of decentralisation. "A liberal measure of decentralisation" recommended Mr. Ashton Davies some years ago, "which places unique executive power in the hands of divisional officers. There may be some people," he goes on, "who believe in centralisation of management. It may be all right for a small business, but it is no good for one that is spread over most of the counties of the kingdom." But what would he say of a scheme for a unified Colonial railway service?

As things are there is a large degree of interchangeability of officers—as a glance at the careers of the senior Colonial railway officers would show. Until rates of pay and conditions of service are unified for Government services as a whole, the rates obtaining for railway officers will differ with every colony. And as conditions of climate and living differ very considerably (c.f. Kenya, Ceylon, and Nigeria) conditions of service will also differ. This, in fact, is recognised to some extent by your contributor, who, no sooner has he recommended a unified Colonial transport service, then he proceeds to divide it up into four groups—not, mark you, according to similarities of climate and problems, but according to size.

History shows that the trend of Colonial development under British rule is towards an ever-increasing measure of self-government. Your correspondent's proposal would tie the transport systems of London, to a central head-

quarters which almost inevitably would lose touch with local requirements, and would introduce a meddlesome and expensive form of bureaucracy into the administration of Colonial railway affairs. Far better to allow Colonial railways to remain in their present independent grouping than to introduce co-ordinating arrangements between such widely decentralised units. What is now proposed is over-centralisation of administration—that most potent cause of inefficiency (as I seem to remember

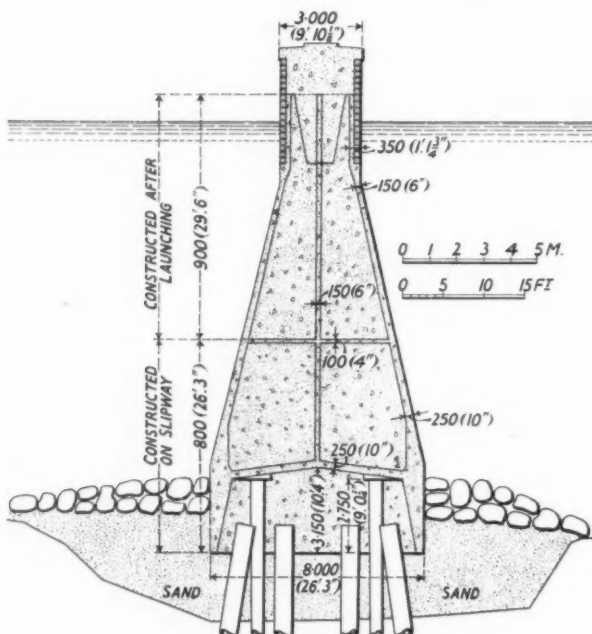
it labelled many years ago by THE RAILWAY GAZETTE); another attempt to lift responsibility from the man on the spot. And much as I regret ranging myself with those whose "mentality resents anything new," I find myself in complete disagreement with your contributor. As for his opinion that under a unified Colonial railway system "*esprit de corps* would become a vital thing," I must confess that to me this remark has no relation to realities or to the practical things of life.

## NEW LIMFJORD BRIDGE, DANISH STATE RAILWAYS

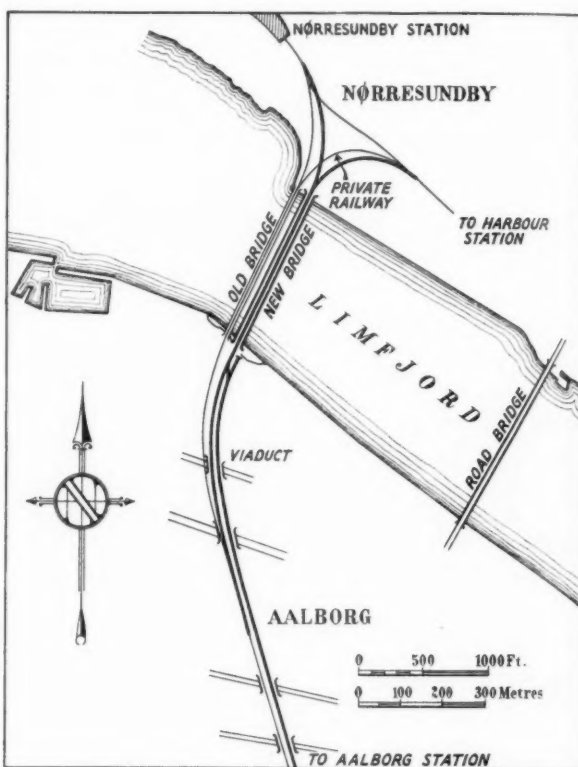
*Yet another remarkable Danish bridge, in which special cylindrical piles of great length were used to carry the caisson foundations*

ON April 23 the new bridge over the Limfjord between Aalborg and Nørresundby in Northern Jutland, was opened for traffic; it replaces the old 400-m. long structure built 59 years ago by the French Compagnie de Fives-Lille at a cost of Kr. 2½ million. The work was extremely difficult for that time, because the channel bed is very soft. In mid-stream, where the depth of water is about 15 m., the bed consists of a layer of mud about 20 m. thick, and near the shore on one side this layer attains a thickness of some 40 m., so that the underlying sand and clay are reached only at depths of about 35-50 m. The old structure is not now up to increasing loads and has, moreover, suffered severely from corrosion.

The first proposal was to strengthen the bridge by means of electric-arc welding, but investigations showed that the material in the old bridge was not suitable for such a process, and another drawback was that its swing span had a free opening of only 19 m., which is very narrow for the ships now passing regularly. It was, therefore, decided to build a new bridge, and to economise by transferring the 220-m. superstructure from the Roskilde Fjord bridge, on the now closed Frederikssund-Ringsted branch



Section through pier showing cellular construction and also arrangement of caisson and piling



Site plan showing old and new bridges and their approaches

line. The Roskilde Fjord bridge was built as recently as 1927, and had five fixed spans each of 36 m. and a bascule span with a 30-m. clear opening.

The new bridge was accordingly designed to embody these spans. Its foundations consist of caissons, founded on piles, and the superstructure, as the illustrations show, combines, in a cantilever design, new anchor spans and some of the old Roskilde spans as suspended spans. One of the new girders is 72 m., and two are each 54 m. long.

### Remarkable Piles

The piles carrying the caissons and piers are cylinders of reinforced concrete, the inner diameter of which is 50 cm. (1 ft. 8 in.) and the outer diameter 66 cm. (2 ft. 2 in.). Each pile was fabricated between an inner welded



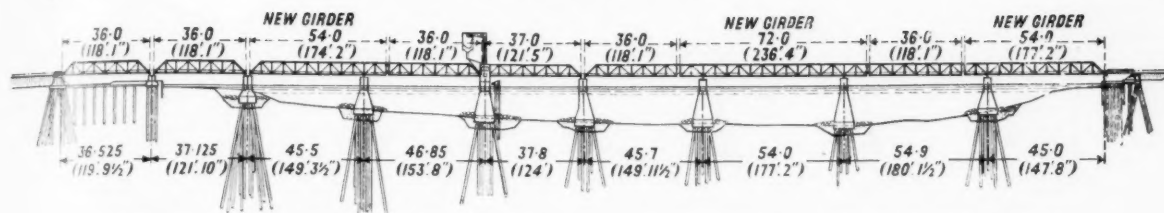


Diagram showing the bridge in side elevation with piling and lengths of girders and spans

steel cylinder and an outer wooden lagging. Vibrators were used to ensure a dense and compact concrete. The two ends of the pile are solid, and the steel cylinder and the reinforcement add to the strength of the pile during the driving. Some of the piles are about 45 m. (147 ft. 6 in.) in length, the longest ever used in Denmark. The driving was done by a 40-m. (130-ft.) steam pile driver with a 6-ton hammer. Some of the piles required as many as 7,000 blows before coming to rest. For the underwater driving a steel tube pile extension was inserted between the pile and the hammer.

#### Arrangement of Caissons and Piling

The caissons were constructed upside down on a slipway, and are of reinforced concrete. Upon launching they capsized and were then towed to their respective sites where their walls were built up, so that they should be above water level when resting on the bottom. Four of the piles under each pier are vertical and were cut off to exact height so that the caisson could be placed on them. Then the solid top ends of the other piles were also cut off, the piles cleaned inside and inspected, and finally filled with concrete. After this the working chamber in the caisson was filled with concrete, so as to form a good connection between piles and caisson; this work was carried out under compressed air to keep the chamber free of water. Finally, the different cells of the pier were concreted. The piers are faced with granite from a level of 1.5 m. upwards.

The spans from the old Roskilde Fjord bridge were taken, three at a time, on two pontoons to Aalborg, where they were placed on two temporary piers consisting of wooden piles, cleaned and painted and the ends altered. Later, the spans were floated out on pontoons to their final positions. The counterweight of the

bascule span, which weighs 330 tonnes, is of concrete and is carried in a steel framework above the main girders. The span is worked by two 20-h.p. electric motors, which can open the bascule in 1 1/4 min.

In connection with the bridgework important works have been carried out on both shores. In Aalborg the approach has been lifted, so as to permit of underbridges being built to replace level crossings. Also, the line from Aalborg station to the bridge, which carries a heavy traffic, has been doubled. In all, four viaducts have been built or widened here. In Nørresundby on the other shore the new bridge entailed a re-arrangement of the southern end of the station yard and also important signalling alterations. The work as a whole was begun in 1935 and has cost about Kr. 3 million.



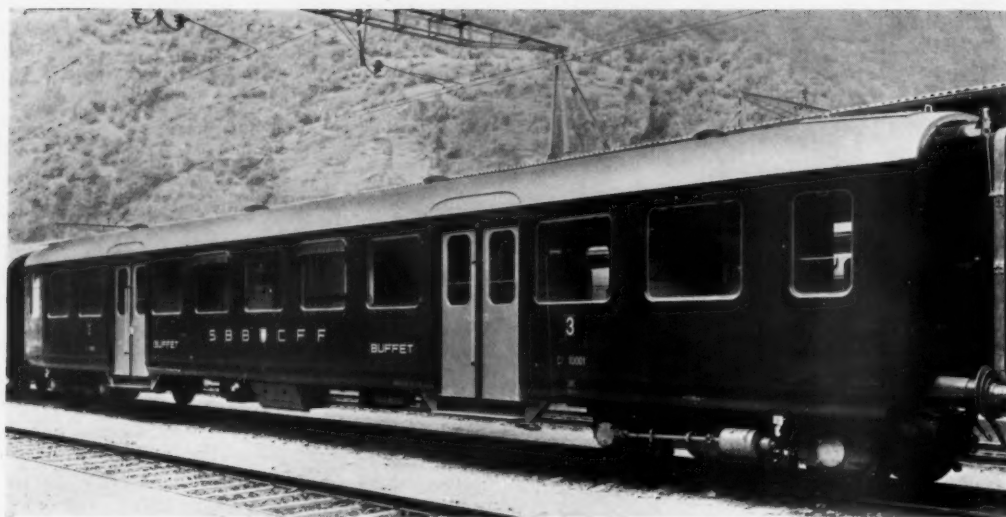
The bascule span being floated out to the piers

**THE NEW ST. JOHN RIVER BRIDGE AT FREDERICTON, C.N.R.**—On May 28, 1937, we gave a very brief description of the new bridge then being built by the C.N.R. to replace the old one—washed away by floods and ice in the spring of 1936—spanning the Saint John River at Fredericton, capital of New Brunswick. So expeditiously has the work been carried out, that the new structure was formally opened for traffic by the Hon. Mr. C. D. Howe, Minister of Transport, the other day.

The new bridge consists of one swing and eight fixed through steel girder spans carried on concrete piers and abutments, and has an overall length of 1,997 ft. The fixed spans are: two of 250 ft., five of 210 ft., and one of 165 ft.; and the swing span measures 260 ft. The rail level of the new bridge is 5 ft. higher than that of the old in order to be safer in time of flood, and the cut-

waters of the piers are faced with steel nose-plates to resist the heavy ice runs to which the bridge will be subjected each spring. The contractor for the steelwork fabrication and erection, totalling 2,750 tons, was the Hamilton Bridge Company, and the Richardson Construction Company was responsible for the substructure, which included 12,000 cu. yd. of concrete.

Due to the rebuilding of the bridge extensive reconstruction was necessary in the terminal arrangements at South Devon, at the end of the bridge. These included a new station and locomotive depot, a new stores building, and the remodelling of the track layout. The driver of the first train to cross the old bridge in 1888, was, according to the *Canadian National Magazine*, on the engine of the gaily-decorated inaugural train at the ceremonial opening of the new bridge.



*View of third buffet car. Note dynamo drive on bogie*



*Left: Interior of second class car showing ample luggage racks and collapsible table for each passenger. The large windows can be let right down. Right: Interior of buffet car showing counter*

**NEW LIGHT-WEIGHT MAIN LINE STOCK, SWISS FEDERAL RAILWAYS**

(See "The Railway Gazette" of June 25 and August 13, 1937)

## A REMARKABLE BOILER EXPLOSION IN FRANCE

*Report on the explosion of a standard P.L.M. 2-8-2 locomotive while hauling a Geneva—Paris express*

THE circumstances of the extraordinary boiler explosion which wrecked a standard 2-8-2 mixed traffic locomotive of the French P.L.M. Railway on August 2, 1935 (see THE RAILWAY GAZETTE, August 9 and 23, 1935) were naturally subjected to the closest exami-

The clothing of the driver and fireman was torn to shreds but showed no trace of burning. Passing over a telegraph line and reaching a height of about 18 m. (59 ft.),\* the boiler fell on its firebox end at a distance of 83 m. (272½ ft.) from the place of explosion, rebounded and fell

on its chimney end, rebounded a second and third time, as indicated in Fig. 1, and came to rest 156 m. (512 ft.) from the point of explosion. The holes dug by the boiler show the trajectory to have been practically in the vertical plane tangent to the track. As found, the nearest (chimney) end of the boiler was about 13 m. (42.7 ft.) from the centre line of the track. But for the curve, the falling boiler would probably have wrecked

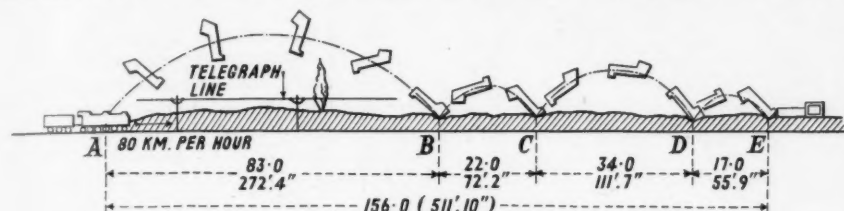


Fig. 1—Showing trajectory and minimum rotation of boiler blown from P.L.M. locomotive 141.C.623 on August 2, 1935

nation by the company. The difficulties of the investigation were increased by the facts that the driver and fireman were killed, and that the boiler was blown off the frames and bounced several times before coming to rest 156 metres (170 yd.) from the spot where the explosion occurred. It is, however, clearly established, by considerations set forth in a report by M. Chan,\* Ingénieur Principal du Matériel of the P.L.M. Company, that the explosion was due to overheating of the firebox crown plate owing to low water, and that the first fusible plug must have melted at least nine minutes before the explosion occurred. Perhaps the interval was longer, and it is only possible to guess why the fire was not dropped, according to regulations, directly the fusible plug melted.

The accident occurred to locomotive 141.C.623, hauling train No. 658, at km. post 68.319 soon after passing the station of Tenay-Hauteville, between Culoz and Ambérieu. From Culoz to La Burbanche the line rises for about 24 km. (14.9 miles), with a maximum gradient of 1 in 83.3, and descends thence to Tenay with a variable declivity reaching 1 in 83.3 at places. The Flaman speed recorder strip was rendered illegible by the explosion, but, according to schedule, the train should have run at about 50 km.p.h. (31 m.p.h.) from Culoz to La Burbanche and passed Tenay at 80 km.p.h. (50 m.p.h.). The weight behind the tender was 619 tonnes (609 tons), and the train stopped at a distance of about 449 m. (491 yd.) under the braking applied by the fracture of the brake connections. This indicates that the speed was about right at the moment of the explosion.

The track at this point is on a right hand curve (radius 1,400 m. or 4,592 ft.). The explosion tore up the grass on each side of the line and removed the boiler bodily from the frames, without derailing the engine or causing any injury to passengers.

the track and the train.

Fig. 2 shows the boiler lying in a field to the left of

\* This figure is determined by a consideration of the dynamics of the case, given in M. Chan's report. Steam, expanding into the firebox through the torn crown plate, separated the boiler from the ashpan and frame, and exerted a vertical reaction breaking the attachments and hurling the boiler into the air with a rotation indicated by the successive positions in Fig. 1. The energy released by the explosion was about 7,600 tonnes-metres (24,540 ton-ft.) from 27 kg. (60 lb.) of steam, and 297,500 tonnes-metres (960,628 ton-ft.) by the release of 7 tonnes (6 t. 17 c. 3 q.) of water at 200° C. (392° F.), 16 kg. per sq. cm. (227.5 lb. per sq. in.), making a total of 305,100 tonnes-metres (985,168 ton-ft.). Even 1 per cent. of this energy would be sufficient to lift the weight of the boiler (35 tonnes or about 34 t. 9 c.) through a height of 90 m. (295.3 ft.). Assuming that the centre of gravity of the boiler moved on a parabolic trajectory, with an initial horizontal velocity of 80 km.p.h. (49.7 m.p.h.), the time for the first bound would be 3.7 sec., corresponding to the attainment of a height of about 18 m. (59 ft.). The movement depicted by Fig. 1, about ½ rev. in 3.7 sec., or about 10 r.p.m., corresponds to an energy of rotation of about 24.2 ton-ft., so that considering the amount of energy available, the boiler may actually have spun much more rapidly. In other words, Fig. 1 represents the minimum rotation that can have occurred. The greater length of the third compared with the second bound may be due to additional impulse from the energy of rotation and perhaps the continued escape of steam



Fig. 2—Boiler of P.L.M. locomotive lying about 512 ft. from the place of explosion

\* Revue Générale des Chemins de Fer, February 1, 1937, page 106





Fig. 3—Remainder of P.L.M. locomotive 141.C.623 after the explosion

the track after the accident, and Fig. 3 shows the remainder of the locomotive with broken boiler seating, piping bent vertically, and lateral ashpans blown down and outwards by the explosion. The primary damage consisted in the tearing of the inner firebox crown plate. Referring to the cross-sectional drawing in Fig. 5 (*top left*), the firebox lay on side *C D* after the explosion and there was an opening of about 1.6 sq. m. (17.2 sq. ft.) area in the crown plate as shown by Fig. 4. The edges of the torn plate indicated that the failure had occurred substantially as shown (seen from beneath) in the lower left-hand drawing, Fig. 5. The copper (14 mm. or 0.55 in. in thickness) presented the characteristic bluish, pickled appearance of a metal which had been subjected to red heat; this extended all over the crown and for about 250 mm. (9 $\frac{3}{4}$  in.) down each side. Evidently, the water level had fallen to this extent, uncovering the plates and permitting the copper to reach a temperature of at least 700° C. (1,292° F.). Of the three fusible plugs, the one in front was not found, the middle one was found detached and melted, and the rear one was in position but melted. The stay-bolt nuts left hexagonal imprints in the copper plate as the latter softened and bulged. The stays (19.5 mm. (about  $\frac{3}{4}$  in.) dia. with 6 mm. ( $\frac{1}{4}$  in.) hole) neither broke nor stretched but their threads and those of the stay-bolt nuts, gave way allowing the parts to slide one over the other.\* The bulging of the plate between stays was specially marked at the front or leading end of the firebox, indicating that heating occurred first at that end.

The part of the plate marked *E* in

\* It is interesting that the three outside rows of stays, right and left, remained intact, although, from their position near curves, they are most susceptible to deterioration. The burst (Fig. 5) did not affect the base of these stays

copper was possibly heated to 800-850° C. (1,472-1,562° F.).

By consideration of the amount of the deficiency of water at the moment of the explosion, it is possible to determine the successive positions of the water level and arrive at a fairly accurate estimate of the time elapsing between the fusion of the first plug and the occurrence

\* At 700° C. (1,292° F.) the tensile strength of copper is about 2 kg. per sq. mm. (1.27 tons per sq. in.), compared with 22 kg. per sq. mm. (13.97 tons per sq. in.) at the normal temperature of the boiler

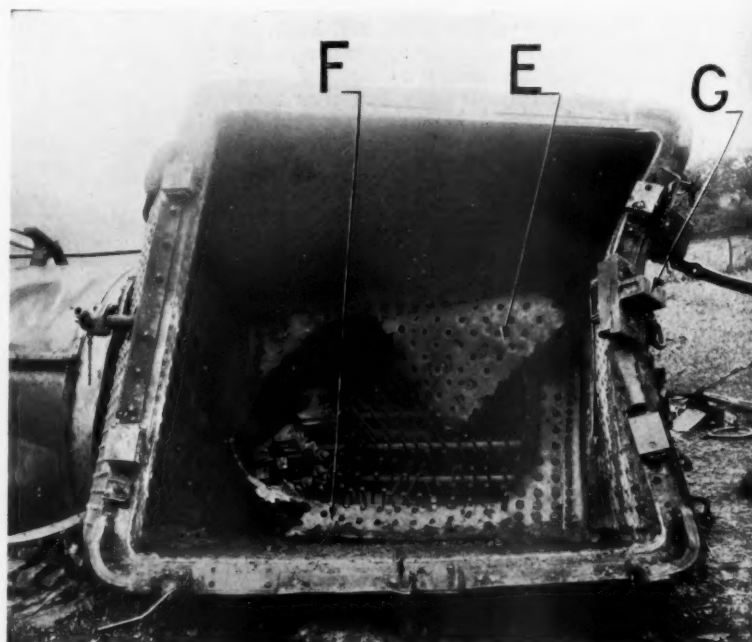


Fig. 4—Inside firebox showing burst crown plate and distortion of rear-end attachments

Fig. 4 must have been blown flat against the side of the firebox, for it bore the imprint of the ends of the side stays and several nuts were found welded in its surface. The plate did not, however, remain on the side wall (like *F*) but sagged under its own weight after the boiler came to rest. The fact that the copper was still hot enough to sag in this way indicates that there had been no last-minute attempt to feed the boiler.

Consideration of the relations between breaking stress and temperature for copper and mild steel lead fairly consistently to the conclusion that the temperature of the firebox crown plate was at least 700° C. (1,292° F.) if the boiler pressure was normal (16 kg. per sq. cm. or 227 lb. per sq. in.) at the time of the explosion.\* Actually, the steam pressure was more likely below normal, the locomotive having just ascended a long incline, in which case the same reasoning indicates that the

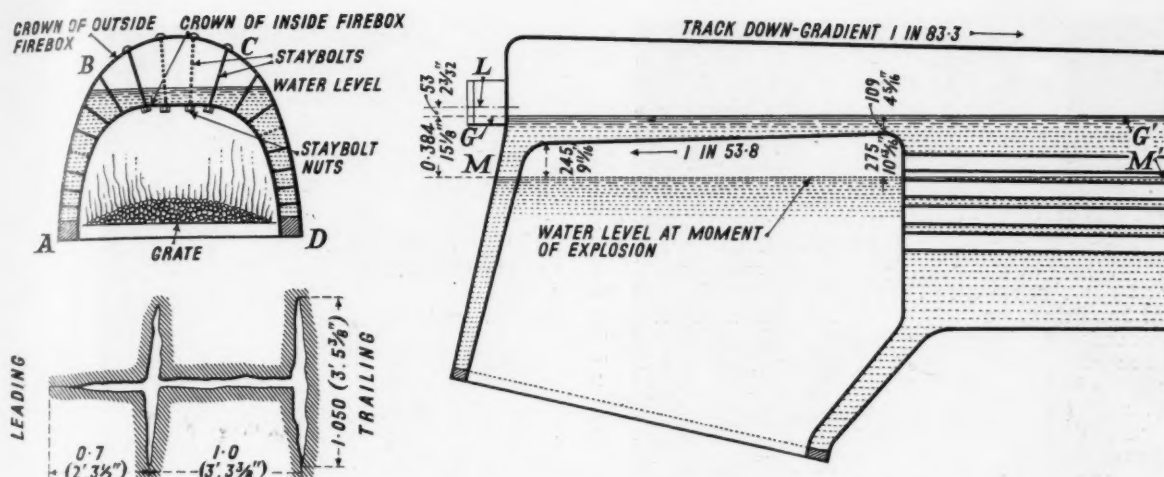


Fig. 5—Illustrating position, nature, and cause of firebox explosion in P.L.M. locomotive 141.C.623

of the explosion. Klinger water gauges are used on locomotives of the type concerned. On the level, the crown of the firebox slopes down 1 in 32.7 from the front to the rear, and with water at the regulation level there is a depth of 126 mm. ( $4\frac{1}{8}$  in.) over the leading end of the firebox crown; the water then shows at L in the gauge glass (Fig. 5) 150 mm. ( $5\frac{1}{8}$  in.) from the top and 110 mm. ( $4\frac{1}{8}$  in.) from the bottom of the glass. On the maximum down gradient of 1 in 83.3 from the Burbanche ridge, the regulation water level in the gauge glass is at G, 53 mm. ( $2\frac{1}{8}$  in.) below the point L. The heat marks on the copper plates after the accident show that the water level actually descended to M M'.

The water level at the moment of the explosion was thus  $109 + 275 = 384$  mm. ( $15\frac{1}{8}$  in.) below the regulation level, corresponding to a deficiency of 3,200 litres (704 gallons). Taking the most unfavourable case, in order to arrive at the minimum time between the blowing of the first fusible plug and the explosion, suppose that neither injector nor feed pump was working from the summit of the incline. The regulator was found closed and must have been closed when, or soon after, the crest was reached; the amount of water in the boiler would then remain constant. With the same quantity of water as represented by level M M', Fig. 5, but with the locomotive on a 1 in 83.3 up-gradient, the water level at the back end

would be 130 mm. ( $5\frac{1}{8}$  in.) above M and 353 mm. ( $13\frac{7}{8}$  in.) below the regulation level for this gradient. The total deficiency of water was still 3,200 l. (704 gall.) and 1,400 l. (308 gall.) would have been required to cover the crown plate.

In other words, the crown of the firebox was uncovered to a depth of 203 mm. (8 in.) at the front, and 115 mm. ( $4\frac{1}{2}$  in.) at the rear on reaching the top of the gradient, and it is only necessary to calculate how long it would take to consume 1,400 litres (308 gall.), in order to arrive at the moment when the crown first became uncovered and the fusible plug melted. Hauling a 619-tonne (609-ton) train at 50 km.p.h. (31 m.p.h.) on an average gradient of 1 in 125, this 2-8-2 locomotive develops about 2,000 metric h.p. (1,974 h.p.) and consumes about 200 kg. (44 gall.) of water per minute.

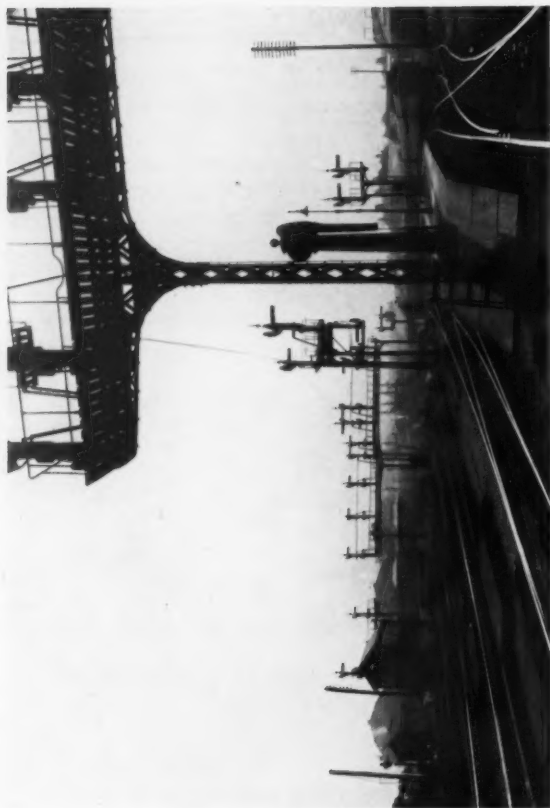
Hence the crown plate became uncovered about 308/44 = 7 min. before Burbanche summit was reached. The train ran about 6 km. ( $3\frac{3}{4}$  miles) down the Tenay declivity, occupying 3 to 4 min., before the explosion occurred. This brings the time from uncovering the crown plate to explosion up to 10 or 11 min. Allowing 1-1½ min. delay for the melting of the plug, there must have been at least an interval of nine minutes between that warning and the disaster, which would almost certainly have been averted if the fire had been dropped promptly.

### The Zakopane Aerial Cableway in Poland

What is believed to be the longest passenger aerial cableway in the world connects Kuznice (4 km. from the popular holiday resort of Zakopane) and Kasprowy Wierch, a distance of 4.2 km. Kasprowy Wierch is a peak in the Tatra Mountains, 6,445 ft. above sea level, whereas the altitude of Kuznice is only 3,385 ft. In plan the alignment consists of two straights roughly equal in length with an angle between them, at Turnie (km. 2). Between Kuznice and Turnie there is a rise of 1,076 ft., and thence to the summit the rise is 1,984 ft. Between the stations the cables are supported by six steel towers varying in height from 46 to 105 ft., and the length of the spans between them are from 403 to 3,385 ft.; the maximum height of the cables above the Kasprowy Valley is about 1,000 ft.

The three stations are of concrete and granite and are complete with all conveniences. A change of cars is necessary at Turnie, as 2.3 km. is said to be

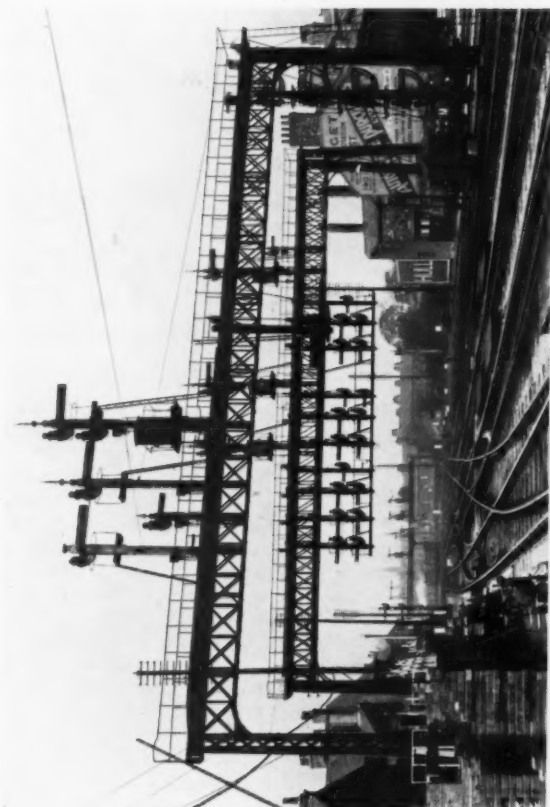
the longest cable procurable. The 1½-in. diameter cables were unwound from their drums and dragged up the valley by motor hoists. Each supporting cable is secured at its top end by being wound three times round a 10-ft. diameter r.c. drum, and the lower end has a 45-ton counterweight, hanging in a pit. In this way change of temperature and the position of the car are compensated for, and a constant tension is maintained. There are two supporting cables on each section, and, in all, four cars of light alloy construction, each carrying 30 passengers. Speed of transit is about 11 m.p.h. Each car has a telephone, bell signalling apparatus, two brakes—electromagnetic and mechanical—and an emergency breeches-buoy type of landing line. The haulage motors are electric, are situated in separate rooms at Turnie, and operate ¾-in. endless haulage cables. The line was begun in 1935 and opened seven months later, in 1936.



*View looking into the terminus before the alterations*



*The same view as above after completion of the new signalling installation*



*Looking westwards before the alterations*



*The same view as above after completion of the new signal box (left), and removal of the old signals*

**VIEW AT HULL, PARAGON, L.N.E.R., SHOWING THE NEW SIGNALLING**  
(See article in "The Railway Gazette" of July 1, pp. 23-26)



## BEYER-GARRATT LOCOMOTIVES FOR THE RHODESIA RAILWAYS

*Record 3-ft. 6-in. gauge performance  
on 60-lb. rail*

IN 1925 the Rhodesia Railways purchased twelve Beyer-Garratt locomotives from Beyer, Peacock & Co. Ltd., for the 143-mile Villa Machado—Umtali section of the Beira—Bulawayo main line. The grade, which is more or less continuous, is 1 in 50 (uncompensated) with 5-chain reverse curves, the total rise being 3,365 ft. After two years' experience with these engines a further six of improved design were obtained, followed by a further ten. All these 28 Beyer-Garratt engines were of the 2-6-2 + 2-6-2 wheel arrangement.

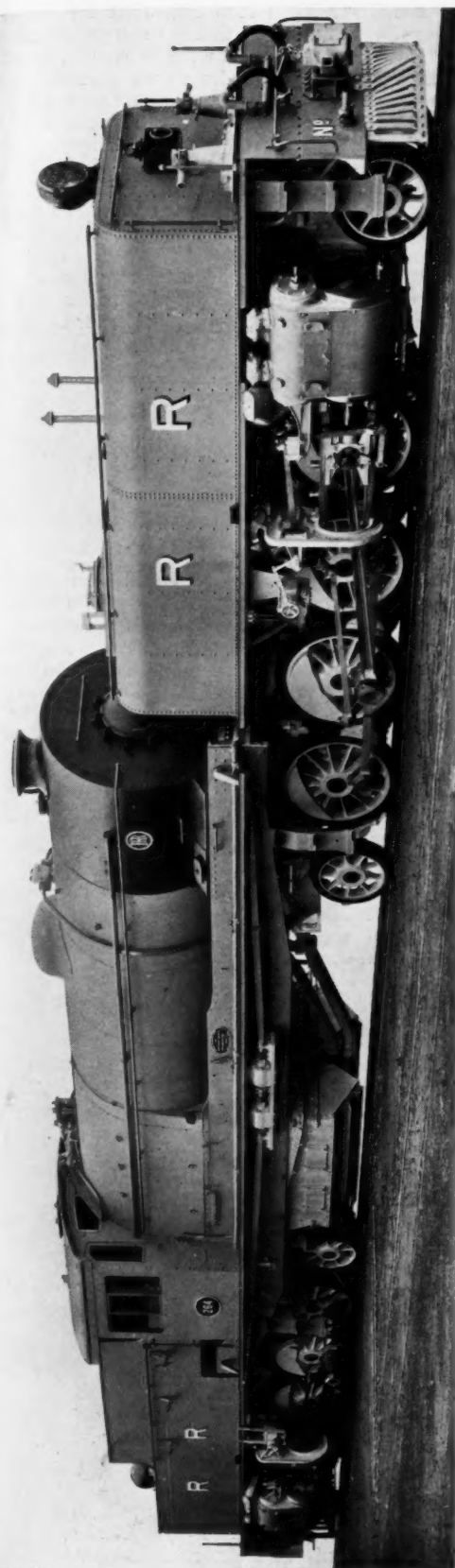
In 1929 eight Beyer-Garratt engines of the 2-8-2 + 2-8-2 wheel arrangement were obtained from the same firm for service on the Bulawayo—Victoria Falls and Salisbury—Umtali sections. These locomotives have given outstanding performance, with the result that a further twelve were recently ordered, of which the last has just been completed at the works of Beyer, Peacock & Co. Ltd. One of these twelve engines is illustrated herewith, and, although a repeat order, various details have been improved in the light of modern practice and experience.

The twelfth engine of the 2-8-2 + 2-8-2 series is fitted with a Davies & Metcalfe exhaust injector, and a Stone Deuta non-recording speed indicator; automatic flange lubricators of the Hasler type are fitted to the bogie wheels of the last two engines. The arrangement of the cab and adjacent bunker has been specially designed not only to suit climatic conditions of the country, but to give the maximum comfort to the enginemen; owing to the long distance run by these engines, they are to be operated chimney first only. When they are in service, the stock of the Rhodesia Railways will include 48 Beyer-Garratt locomotives, and the whole of the main line from Salisbury to Villa Machado, a distance of 312 miles laid with 60-lb. rail, will be entirely operated by Garratt engines, the traffic including mail, passenger, and goods trains. The maximum permitted speed is 40 m.p.h. between Salisbury and Umtali, and 30 m.p.h. from Umtali to Villa Machado.

The following are the leading dimensions of the 2-8-2 + 2-8-2 type now being shipped, and illustrated alongside:—

Cylinders (4), dia.	18½ in.
Piston stroke	24 in.
Coupled wheels, dia.	4 ft.
Wheelbase:—	
Each unit	24 ft. 9 in.
Rigid	8 " 9 "
Total	73 " 7½ "
Boiler heating surface:—	
Tubes	2,126 sq. ft.
Firebox (including arch tubes)	212 "
Total evaporative	2,338 "
Superheater	480 "
Combined heating surfaces	2,818 "
Boiler pressure	180 lb. per sq. in.
Grate area	49.5 sq. ft.
Fuel capacity (coal)	6 tons.
Water capacity	4,500 gallons.
Adhesive weight in working order	106 tons.
Total weight in working order	150.5 tons.
Factor of adhesion, in working order (85 per cent. B.P.)	4.5.
Maximum axleload	13.35 tons.
Tractive effort at 75% boiler pressure	46,200 lb.
Tractive effort at 85% boiler pressure	52,360 lb.

The mileages run by these Garratt locomotives on the Rhodesia Railways are particularly noteworthy. During



*New 2-8-2 + 2-8-2 Beyer-Garratt locomotive for the Rhodesia Railways*

1937 increase in traffic necessitated intensive working of engines, and this exceptional performance was obtained by pooling and a cleverly worked-out system of changing engines *en route*. The result has been that, in spite of the arduous conditions under which the engines work, the small wheel (4 ft. 0 in.) and comparatively low speed, mileages have been obtained which are probably a world record for the 60-lb. rail and 3-ft. 6-in. gauge. For instance, during some months in 1937 the six-coupled Garratts working on the 1 in 50 grade section averaged 4,000 to 5,000 miles a month, sixteen of them averaging 5,338 miles in one month. The eight-coupled Beyer-Garratts of the type illustrated have run an annual mileage each of roughly 40,000 to 60,000, and in August, 1937, the average monthly mileage of this class was 5,859 miles each, while during 1937 this type ran a

greater monthly mileage than any other type of engine on these railways. Further, during the month cited above all 36 Beyer-Garratt engines were in service, running a total mileage of 178,428 miles or an average of 4,956 miles each. These excellent performances reveal a high operating efficiency particularly for single line working and also indicate the reliability and capacity of this type of articulated engine for the intensive work required.

The latest twelve locomotives have been shipped to Beira in three parts, namely the two units and the boiler in its cradle; they will be hauled to Umtali workshops for completion.

The engines have been built to the requirements of the Chief Mechanical Engineer, Major M. P. Sells, and under the inspection of the consulting engineers, Sir Douglas Fox & Partners.



Left : Decorated locomotive on the Brünig Railway jubilee commemorative train, at Brünig station, at the summit of the pass. An article in our issue of June 17 dealt with the jubilee of this interesting Swiss mountain railway

[Photo by Burch, Lungern]

Right : A night view of the pavilion of the British railways at the Empire Exhibition, Glasgow, showing the effect of the illumination installed by the General Electric Co., Ltd. A daylight view was reproduced on page 897 of our issue of May 6 last at the time that the exhibition was opened by the King and Queen



## CONVERTED IVATT ATLANTIC LOCOMOTIVE, L.N.E.R.

*Originally built with two cylinders, later converted to a four-cylinder simple, and now rebuilt with two cylinders and long-travel valves*

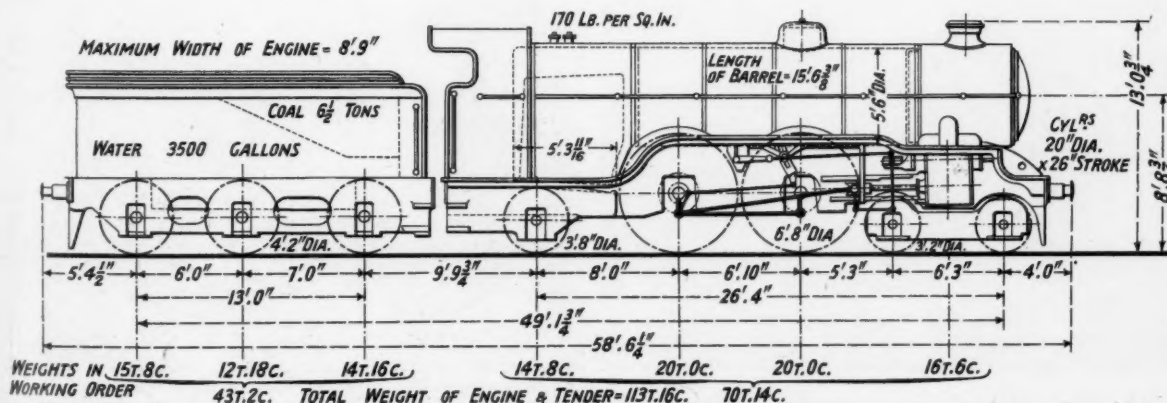


ENGINE No. 3279 of the L.N.E.R. was originally built as one of Ivatt's standard big-boilered two-cylinder Atlantics in 1904 and numbered 279. In 1915 it was converted into a four-cylinder simple engine with 15-in. by 26-in. cylinders. The outside valves, which were placed above the cylinders, were operated by Walschaerts gearing. The inside valves were below the cylinders and actuated through rockers from extensions to the valve spindles of the outside cylinders. In order to accommodate these cylinders a new swing link bogie was fitted having wheels 3 ft. 2 in. diameter instead of 3 ft. 8 in. as on the standard bogie. A 24-element superheater was also fitted.

The engine ran in this form from 1915 to 1937, compiling in that period a mileage of 629,300 between London and the North, and in later years frequently worked the Queen of Scots Pullman express. During its latest overhaul the engine has been re-converted to the two-cylinder type, with cylinders of the same pattern as those of the Class K2 2-6-0 mixed traffic engines. They are 20 in. diameter by 26 in. stroke and are fitted with 10-in. diameter piston valves operated by Walschaerts gear. The valves have a lap of  $1\frac{9}{16}$  in., a lead of  $\frac{3}{16}$  in. and line-and-line exhaust. The valve travel at 70 per cent.

cut-off is 6 in. The exhaust ports are carried through a cast steel smokebox saddle to the blast pipe base. In accordance with modern practice a more commodious cab has been provided, and the frame at the trailing end has been lengthened accordingly. In its new form the engine weighs 70 tons 14 cwt., of which 40 tons are carried on the couples wheels. The tractive power at 85 per cent. of the boiler pressure is 18,785 lb., and the factor of adhesion 4.77. In other respects No. 3279 conforms to the leading dimensions of the standard large Ivatt Atlantics as follow:—

Driving wheels, dia. . . . .	6 ft. 8 in.
Evaporative heating surface—	
Tubes . . . . .	1,824 sq. ft.
Firebox . . . . .	141 "
Total . . . . .	1,965 "
Superheating surface . . . . .	568 "
Combined total . . . . .	2,533 sq. ft.
Firegrate area . . . . .	31.0 sq. ft.
Working pressure, per sq. in. . . . .	170 lb.
Water capacity of tender . . . . .	3,500 gal.
Coal capacity of tender . . . . .	6½ tons.
Weight of tender, full . . . . .	43 tons.



Outlined dimensioned drawing of Atlantic locomotive No. 3279, L.N.E.R. as rebuilt with K.2 class cylinders

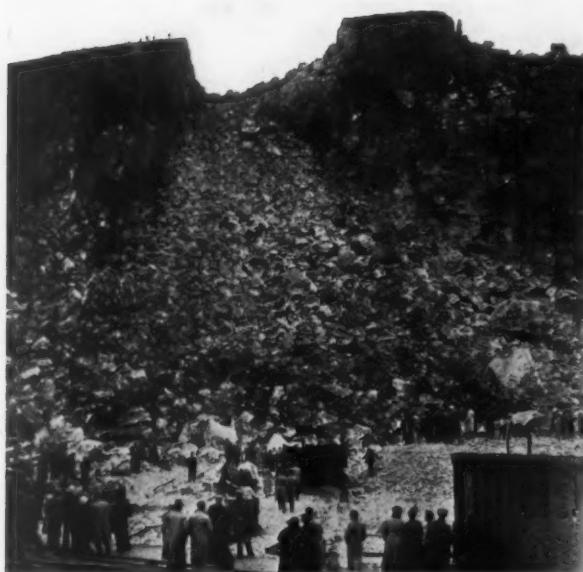


## The 100,000-ton Blast at Caldon Low

(See pages 105 and 141)



*Aerial view of Caldon Low quarries and works before the blast*



*Left : The produce of the blast at Caldon Low quarries on Tuesday last. Right : Sir Francis Joseph (in crash helmet) a Director of the L.M.S.R., selecting a 25-ton block to be used as a foundation stone for the new Euston station. Mr. W. H. Hamlyn, the L.M.S.R. Architect, is seen with the two-foot rule*

## RAILWAY NEWS SECTION

### PERSONAL

Mr. A. C. Griffin, O.B.E., B.Eng., has recently been appointed Secretary of the Indian Railway Board. On his appointment as an Assistant Engineer, Indian State Railways, he arrived in India in October, 1911, and was posted to the North Western Railway. Being an officer in the Royal Engineers Special Reserve, he was recalled to military duty and left

Divisional Superintendent, Rawalpindi, and just two years later was transferred to Delhi in a similar capacity. After five months' leave he was selected as Secretary of the Railway Board in May last. During his war service Mr. Griffin was mentioned in despatches and was awarded the O.B.E. (Military) in January, 1919.

Mr. H. M. Collings, who, as announced in THE RAILWAY GAZETTE

Chief Clerk in that office, and three years later was appointed Assistant to the Suburban District Goods Manager. Mr. Collings was transferred in 1933 as Assistant to the London City Manager, which position he now vacates on taking up his new appointment.

We regret to record the death, on July 5, of Mr. Christopher Charles Verrinder, who retired in December,



**Mr. A. C. Griffin, O.B.E., B.Eng.**

Appointed Secretary of the Indian Railway Board



**Mr. H. M. Collings**

Appointed London Suburban District Goods Manager, L.N.E.R.



**The late Mr. C. C. Verrinder**

Formerly Agent General in France for the British Railways

India for active service in November, 1914. In 1916 he was transferred from the European to the Mesopotamian front, where he served under the Railway Directorate and was appointed a Deputy Assistant Director of Railways. In 1918 Mr. Griffin was transferred to the War Office for work in connection with the Transportation Commission to the Peace Conference in Paris. His services were lent to the Civil Government of Mesopotamia in April, 1920, and he served there as Deputy Director of Railways until June, 1924, and subsequently as Director. He returned to India in November, 1925, and was appointed Divisional Engineer, Karachi, N.W.R.; later he was placed on special duty there in connection with the design and layout of railways in the Port Area. In November, 1930, Mr. Griffin was appointed Principal of the Walton Training School for the staff of the N.W.R. For two periods—July–September, 1931, and April–November, 1933—he officiated as Deputy Agent of that system. In November, 1934, he was appointed

of July 7, has been appointed London Suburban District Goods Manager, London & North Eastern Railway, entered the service of the former Manchester, Sheffield & Lincolnshire Railway in the Manchester District, and was transferred to Marylebone Goods Department upon the opening of the Great Central line to London in 1899. In 1907 he was appointed Relief Clerk on the staff of the London District Goods Manager, and three years later was transferred to the Chief Goods Manager's Office as special Relief Clerk, in which capacity he was engaged for varying periods at all the principal stations on the Great Central Railway. Subsequently, Mr. Collings acted as Chief Claims Clerk and held other positions in the Chief Goods Manager's Office until 1917, when he was made Chief Clerk to the Marylebone District Goods Manager. After the absorption of the G.C.R. into the L.N.E.R. system and upon the formation of the London Suburban District Goods Manager's Office, King's Cross, in 1926, he took up the position of

1934, from the position of Agent General in France for the British Railways. He began his railway career on the former London & South Western Railway, and was transferred from the Superintendent of the Line's office to the Paris office of that railway in 1914, as Assistant to the Agent. In 1916 he was appointed Acting Agent and remained in charge of the office during the whole time the Havre–Southampton route was the only one open to civilian passengers. In 1921 Mr. Verrinder was confirmed as Paris Agent, and after the amalgamation, became General Agent for France, Southern Railway, in July, 1924. In June, 1932, he was created a Chevalier of the Legion of Honour. It was in January, 1934, that he was appointed Agent General in France for the British Railways. Mr. Verrinder frequently acted as liaison officer with the French railway administrations in arranging journeys of notable personages, including King George V. Mr. Verrinder was 62 years of age and was



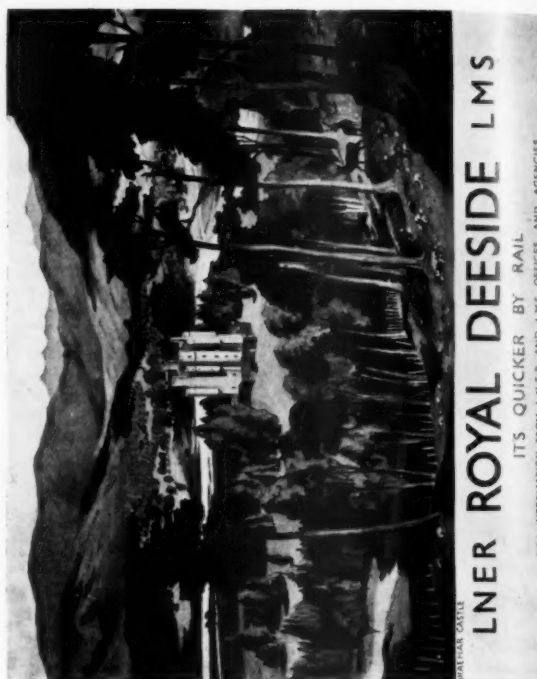
Left: A railway view in the Western Highlands by Kenneth Henderson

Right: "Captain Cook at Whitby," a poster by Doris Zinkeisen embodying the result of considerable historical research



Left: An impressive scene of industry by night, the work of Frank H. Mason

Right: A poster by J. McIntosh Patrick, whose picture "Exmoor Farm" was hung at the Royal Academy this year and has now been sold to the Ferens Art Gallery, Hull



L.N.E.R. POSTERS FOR 1938 (See article opposite)



the son of the late Mr. E. W. Verrinder of the L.S.W.R.

#### L.M.S.R. APPOINTMENTS

The following appointments have been approved by the directors:—

Mr. F. A. Pope, General Assistant to Chief Operating Manager, Euston, to be Superintendent of Operation, Chief Operating Manager's Office, Euston (recorded last week).

Mr. W. P. Keith, Assistant to Controller for Inspection, Hotels Department, St. Pancras, to be General Superintendent (Dining Car Services), Euston.

Mr. C. S. Harrison, Head of Section, Central Office, Euston, to be Assistant, Central Office, Euston.

Mr. J. W. Kerr, Chief Clerk, Transfer Office, Euston, to be Assistant to Registrar, Euston.

Mr. W. Eastland, Head of Section (Expenditure), Chief Commercial and Chief Operating Manager's Office, Euston, to be Staff Asst to District Goods Manager, Broad Street.

Mr. W. Swarbrick, Senior Clerk (Canvassing and General), District Passenger Manager's Office, Manchester, to be Assistant to District Goods, Passenger and Docks Manager, Barrow.

Mr. A. Hawthorne, Chief Commercial Clerk, District Goods and Passenger Manager's Office, Stoke, to be Assistant to District Goods and Passenger Manager (Passenger), Stoke.

Mr. R. W. Mallinson, Goods Agent, Watford, to be Goods Agent, Commercial Road.

Mr. M. A. Sargent, Goods Agent, Maiden Lane, to be Goods Agent, Watford.

Mr. G. H. Hayday, Agent's Outdoor Assistant, Commercial Road, to be Goods Agent, Maiden Lane.

Mr. P. S. Ellis, Stationmaster, Mirfield, to be Yardmaster, Edge Hill.

Captain C. W. Wood, Dredging Superintendent, Fleetwood, to be Dock-, Harbour- and Dredgingmaster, Fleetwood.

Mr. S. J. Whitehead, Stationmaster, Warrington, to be Stationmaster and Goods Agent, Hemel Hempstead and Boxmoor (also supervises Hemel Hempstead).

Mr. T. Finch, Assistant Stationmaster, Crewe, to be Stationmaster, Warrington.

Mr. N. R. Peach, Foreman Fitter, Motive Power Depot, Derby, to be Assistant District Locomotive Superintendent, Kentish Town.

From *The London Gazette* of July 5:—Territorial Army, Royal Engineers; Engineer and Railway Staff Corps: Thomas Wright Royle, M.B.E., to be Lieutenant-Colonel. (July 6, 1938.)

Mr. Royle is Chief Operating Manager, L.M.S.R.

Colonel Woodbine Parish, Director of the Buenos Ayres Great Southern and Western, Central Uruguay, Great

Western of Brazil, and other South American railways, whose death we announced in our issues of May 13 and 20, left estate valued at £2,676 (£2,016 net).

We regret to record the death on July 11, at Falconhurst, Edenbridge, Kent, at the age of 77, of the Right Hon. Sir George John Talbot, who was a Judge of the King's Bench Division from 1923 to 1937, when he retired

and was sworn a member of the Privy Council. As Mr. G. J. Talbot, K.C., he enjoyed a large practice at the Bar before his elevation to the Bench, and frequently "led" for the former Midland Railway Company in proceedings before Parliamentary Committees. He was a member of the Railways Amalgamation Tribunal appointed under the Railways Act, 1921, to settle the amalgamation and absorption schemes of the four group companies.

## L.N.E.R. Posters for 1938

(See illustrations opposite)

L.N.E.R. posters are presented in a variety of styles which keeps their interest fresh, without departing from a straightforward form of appeal that can be universally appreciated. Whether the beholder's eye is caught by Doris Zinkeisen's now familiar impression of the Coronation at speed, or by the more naturalistic studies of ancient cities and buildings on the L.N.E.R. system, there is no headache over deciding what the artist means, or anxiety that some of his subtleties have been lost.

History provides much inspiration, and in Doris Zinkeisen's Whitby poster, which we reproduce from among the new ones issued by the company for the current year, it will be seen how economical letterpress links up past with present interests. The scene is the product of detailed research into costume and naval architecture. Two other posters—"Lincoln," by Gordon Forsyth, R.I., and "The Shambles, York," by H. Tittensor—show that ancient and modern can be combined in one composition without either detracting from the other. Thus, in Mr. Tittensor's Lincoln poster a Belisha beacon is glimpsed through an arch of the ancient Stonebow, and in the foreground is a newspaper boy with a placard announcing football results; Mr. Tittensor places a twentieth-century butcher and two elegant customers in a prominent position in his view of the Shambles at York. Such devices give an impression of continuity. Time marches on, but whatever may happen to ourselves in our declining years, old buildings do not necessarily become museum pieces, remaining instead as pleasant a background for our own daily lives as they were for those of our ancestors.

From the company's landscape posters we reproduce "Royal Deeside" by J. McIntosh Patrick, whose picture "Exmoor Farm" was hung at the Royal Academy this year and has now been sold to the Ferens Art Gallery, Hull, for £400. "Royal Deeside" shows Braemar castle from a well-selected viewpoint which leads the eye down to the castle and river in the hollow of the valley, and then across the green and wooded slopes of the hills to the blue mountains beyond. There is a fine air of spacious-

ness and distance about this poster that compels the eye to dwell upon it, and the mind to toy pleasantly with the idea of visiting the scene depicted.

A somewhat similar sense of distance has been caught by Kenneth Henderson in "Western Highlands," which we reproduce. One envies the passengers in the train making its way along the single line down the valley, and would like to join them as they ride on to where the hills become steeper and darker, and, it seems likely, railway and river keep closer company in a narrow defile.

The L.N.E.R. has in Mr. Frank H. Mason an artist who can make the most of industrial scenes, as is well exemplified in his colliery picture, "East Coast Industries." It would take a colour reproduction to do justice to this poster by bringing out the dramatic value of the deep blue and red tones of which it is composed, and the boldness with which the pit-head gear is silhouetted against a sky shading to orange. Mr. Mason joins with another well-known L.N.E.R. name—Mr. Tom Purvis—in one of two posters showing The Coronation approaching Scotland. Mr. Mason has selected the actual moment of crossing the border, which takes place at a point where the line is close to the sea-shore, and the islands off the Northumbrian coast are to be seen in the distance. This is a scene of such interest that the unusual step has been taken of labelling some of the landmarks on the poster, including the Farne Islands of Grace Darling fame, and the castles of Bamburgh and Dunstanborough.

Mr. Purvis's Coronation poster is a view of the train crossing the Royal Border bridge at Berwick. The broad expanse of river that is the predominant note in the poster is depicted in a striking yellow tint, similar to that of the twilight sky, and the two yellow masses are contrasted with the dark green of the landscape that divides and frames them so as to stand out with extra force. A long streamer of steam from the locomotive leads the eye to the train, giving it just the right emphasis in a view where scenic and railway interest are nicely balanced. A little knot of spectators in the foreground strikes an authentic note that will be appreciated by all who have travelled in the Coronation.

## STAFF AND LABOUR MATTERS

### Railway Shopmen—Industrial Court Decision

The Industrial Court sat on June 24 to determine the claim of certain artisan staff employed in the canal department, Marsden, L.M.S.R., to be paid an enhanced rate, under Clause 7 of Schedule "F" to Award No. 728, in respect of April 11 and 13, 1936 (Saturday and Monday at Easter), when they were required to take duty for the purpose of canal repair work. The normal duties of the men concerned are repairs to and renewals of field and lock gates, bridges, walls, canal feeders, culverts, buildings, roads, boats, &c.

In support of the claim the National Union of Railwaymen contended that the kind of work on which the men were engaged on Saturday and Monday at Easter, 1936, is not of an ordinary nature and can be undertaken only when the mills are closed and not drawing water, and when boat traffic is not running and that had the work not been done at Easter the shop would have been closed. The work necessitates the stoppage of the canal, and if advantage had not been taken of the Easter holiday period the work could only have been done at week-ends, and would have taken four or five week-ends to complete. When the mills restarted on the Wednesday following Easter the repair work was suspended until the week-end.

It was stated that it is the practice for the shop at Marsden to be closed during holiday periods, the previous occasion on which the men were required to work on a Bank Holiday was in 1928, when the men were paid the enhanced rate. It was contended that normal work constitutes that class of work which can be carried out on any ordinary week day and that the work on which the men were engaged on the Easter holidays in question can only be done at certain times and under certain conditions.

In opposing the claim the company stated that it is part of the normal duties of the men concerned to carry out repairs to the canal. These duties include repairing and renewing the worn parts of the locks, this work, including repair to the lock gates and sluices, is also performed on week days. If it is necessary however to repair the bottom portion of a gate, or the iron bumper or the sills, which are under water, the work can only be done when no traffic is passing and can, therefore, only be done at the week-ends. This particular kind of work is actually carried out on the canal at the week-end from seven to ten times a year.

In this connection the company relied on Clause 4 of Industrial Court Award No. 863. In regard to the requirement set out in Award No. 863 that in order that a man may be entitled to extra payment under condition 7 of the schedule "the normal

work must be suspended in the railway workshop, running shed, or depot concerned," it was submitted that the work performed by the men concerned during the Easter holiday in 1936 forms part of their normal duties and that the normal work of the men was not suspended on the days in question. With regard to the payment made in 1928, the payment was made locally, and, the company contended, was made in error. The company accordingly submitted that the men concerned in the present claim are not entitled to the extra payment because their normal work was not suspended.

The industrial court takes the view that having regard to the ordinary and customary duties of the men concerned and to the nature of the work which they were called upon to perform on the Bank and public holidays in question, it cannot be held that the normal work was suspended on those days and by Award No. 1,706, dated July 4, it decides accordingly.

### Electricity Supply Industry—Wages

The Industrial Court, by Award No. 1,707, rejected a claim for 2½d. an hour increase for workpeople in the electricity supply industry. The claim was referred to the Court by the Joint Industrial Council for the industry, which had failed to agree. The claim was for the balance of the 3d. an hour claimed by the unions last year, of which the employers conceded ½d. last December. The unions based their claim primarily upon the ability of the industry to pay increased wages to these workpeople. For the employers it was contended that the settlement last December was a very favourable one and put the electricity workers in a preferential position in relation to other industries.

### Steel Workers—Wages

Under the national agreement between the Constructional Engineering Union and the Engineering and Allied Employers' National Federation, wages of men employed on constructional steel contracts have been increased all round by 1d. an hour. In addition, the lodging allowance has been raised to 24s. 6d. a week outside London and to 28s. a week in London.

### Holidays with Pay Bill

Following the report of the Departmental Committee which enquired into the question of holidays with pay under the Chairmanship of Lord Amulree, the recommendations of which were outlined in our issue of May 6, the Government has introduced a Bill entitled "Holidays with Pay Bill." The principal object of the Bill is to enable certain wage regulating authorities to require the provision of holidays with pay. It follows in this respect the recommendation of the Report of Lord Amulree's Committee. Clause 1 empowers trade boards, agricultural wages

committees both in England and Wales and Scotland, and the Road Haulage Central Wages Board to direct that any workers whose wages they regulate shall be granted holidays. The duration of such holidays is to be related to the period of employment with an employer: Clause 2 requires the wage regulating authorities to provide that workers shall receive pay in respect of any period of holiday granted under their direction. It also empowers trade boards and agricultural wages committees to fix the remuneration to be received in respect of holiday periods. The Road Haulage Central Wages Board will receive similar powers when the Road Haulage Wages Bill becomes law. Clause 3 provides the same procedure for the making, cancellation, and variation of Orders for these purposes as for Orders regulating wages, subject to any modification prescribed by regulations made by the appropriate Minister, who may also make regulations for giving effect to the purposes of the Bill. All regulations are to be laid before Parliament. Clause 4 enables the Minister to assist the administration of voluntary schemes for securing holidays with pay for any workers in an industry or branch of an industry.

## Railway and Other Reports

**Egyptian Delta Light Railways Limited.**—Gross receipts for the year ended March 31, 1938, amounted to £228,908, against £213,114 for the previous year. Expenditure rose from £180,862 to £197,340, with an operating ratio of 86.21 per cent. against 84.87 per cent., leaving a balance to net revenue account of £31,568, compared with £32,252. The directors are unable to recommend payment of a dividend on the preference shares for the year under review. Passenger traffic receipts increased from £132,759 to £141,622, and the number of passengers from 12,658,835 to 14,360,132. Goods traffic receipts were £83,271 against £76,269, and the tonnage lifted increased from 568,005 to 638,476. During the year under review experiments were made with a diesel tractor and coach.

**Charles Roberts & Co. Ltd.**—The net trading profit for the year to March 31 last was £184,170, against £157,510 for the previous year. Net profit, less depreciation of wagons and plant (£75,992), and less income tax and N.D.C. (£30,500) amounts to £77,678, compared with £60,098 for the previous year. The directors recommend a dividend on the ordinary shares of 10 per cent., comparing with the same rate on a smaller capital, devote £27,000 to writing down the book value of shares in a subsidiary company, and place £4,826 to debenture stock sinking fund, leaving £28,915 to be carried forward, against £24,159 brought in. All the ordinary capital now ranks for dividend, whereas for the previous year £140,000 of it received only 1½ per cent.

## Home Railway Returns for 1937

Returns of the capital, traffic, receipts, working expenses, and operating results of the railway companies of Great Britain for the year 1937 have been issued by the Ministry of Transport, following on the preliminary statement published in March. The aggregate figures do not now include those of the London Transport railways.

The amount appropriated for the payment of interest and dividends in 1937 was £38,245,178, compared with £36,439,402 in 1936, £34,348,660 in 1935, £33,113,722 in 1934, £30,832,409 in 1933, and £28,840,481 in 1932. These figures represent 3·43 per cent., 3·26 per cent., 3·08 per cent., 2·97 per cent., 2·76 per cent., and 2·59 per cent., respectively, upon the total capital receipts. On ordinary stock issued, the average return per cent. was 1·79 in 1937, against 1·44 in 1936, 0·96 in 1935, 0·86 in 1934, 0·76 in 1933, and 0·57 in 1932.

The length of road open for traffic at December 31, 1937, was 20,080 miles, a decrease of 41 miles. Expressed as single track, the total mileage of running lines was 36,799 (a decrease of 44 miles), and of sidings 15,627 miles (a decrease of 66 miles). Of traffic locomotives there were 19,750 steam, against 19,974, electric 13 (the same), and petrol, oil, and oil electric 43, against 42. Among rail-motor vehicles are included 1,874 electric (against 1,637), and 123 "other" (against 131). Passenger-carrying vehicles together numbered 43,682, an increase of 120. The number of merchandise and mineral vehicles increased from 635,946 to 656,834, and the total tonnage capacity of these vehicles, excluding brake vans (13,565) was 7,675,411, an increase of 310,598 tons. The average capacity per vehicle rose from 11·83 tons to 11·93 tons. Twelve-ton wagons have increased in number from 154,118 in 1925 to 312,842 in 1936 and 338,728 in 1937. Of wagons (other than special vehicles) of 20 tons capacity and over, there were 34,274 at the close of 1937, of which 30,097 were allocated specially to mineral traffic. Corresponding figures at the end of 1936 were 31,277 and 27,731, respectively. Private owners' vehicles registered in 1937 included 9,342 12-ton and 749 20-ton coal wagons, compared with 8,573 12-ton and 487 20-ton wagons in 1936. Railway-owned containers have increased from 6,290 in 1931 to 11,269 in 1935, 13,034 in 1936, and 13,845 in 1937.

Total receipts from passengers in 1937 were £58,588,514, an increase of £2,815,144, or 5·04 per cent. First class ordinary receipts amounted to £3,914,829, an increase of £293,452, or 8·10 per cent., and third class ordinary receipts to £42,365,931, an increase of £2,143,623, or 5·33 per cent. Passenger journeys at standard fares were 14·04 per cent. of the total ordinary passenger journeys in 1937, as against 64·97 per cent. in 1924, and the corresponding

receipts were 15·15 per cent. in 1937 and 65·59 per cent. in 1924. Third class season ticket receipts rose by 2·71 per cent. from £6,059,549 to £6,223,795, and first class from £1,518,217 to £1,521,273. The Southern, which has the largest season-ticket revenue of any of the four main-line companies, was the only one to record an increase (£19,011) in first class season ticket receipts in 1937. Gross receipts from parcels and miscellaneous passenger train traffic (excluding mails and parcels - post) in 1937 were £12,736,668, an increase of £246,157.

The total volume of higher class merchandise rose from 48,323,881 tons in 1936 to 50,318,949 tons in 1937. Of minerals and merchandise (Classes 1-6) 58,683,288 tons were conveyed in 1937, against 54,873,667 tons in 1936, and the weight of coal, coke, and patent fuel rose from 177,514,546 tons to 188,149,287 tons. Excluding free-hauled traffic, the average haul for higher class merchandise and livestock was 105·94 miles in 1937, compared with 106·46 miles in 1936, and the average receipt per ton-mile was 1·948d., against 1·960d. For minerals and merchandise (Classes 1-6) the average haul rose from 63·91 miles to 64·01 miles, but the average receipt per ton-mile fell from 0·974d. to 0·966d. The average haul for coal rose from 43·32 miles to 43·50

### BRITISH RAILWAY CAPITAL, 1937

	£
Capital authorised ... ..	1,264,809,048
Capital created ... ..	1,184,031,813
Capital issued ... ..	1,127,020,707
Deduct balance of nominal additions and deductions ...	44,579,345
Capital issued (excluding nominal additions and deductions)	1,082,441,362
Add balance of premiums and discounts ... ..	33,924,795
Deduct calls in arrear and amount uncalled ... ..	22,424
Sinking fund debenture stock redeemed ... ..	210,000
Total capital receipts ... ..	1,116,553,733
Capital expenditure :-	
On railway ... ..	1,024,084,727
On road vehicles ... ..	4,481,754
On steamboats, &c. ... ..	9,083,733
On docks, harbours, and wharves ... ..	71,585,248
On hotels ... ..	9,657,493
On electric power stations, &c. ... ..	2,793,316
Subscriptions to companies other than railway ... ..	12,057,019
Total capital expenditure ...	1,190,372,259
Capital expenditure in excess of capital receipts ... ..	73,818,526
Total capital powers and other assets available for further expenditure ... ..	20,373,211

miles, and the average receipt per ton-mile from 1·029d. to 1·037d.

Expenditure on railway working increased by £5,565,236, but the operating ratio fell from 79·62 per cent. to 79·43 per cent. In traffic expenses there was an increase of £1,540,462, chiefly in salaries and wages. Locomotive running cost £1,809,863 more due mainly to increases of approximately £885,000 for salaries and wages, £765,000 for fuel for steam trains, and £121,000 for electric current.

TABLE OF REVENUE RECEIPTS AND EXPENDITURE

	Year 1937			Year 1936		
	Gross receipts	Expenditure	Net receipts	Gross receipts	Expenditure	Net receipts
Railway ... ..	£171,391,608	£136,135,587	£35,256,021	£163,983,487	£130,570,351	£33,413,136
Road transport ... ..	707,878	579,365	128,513	707,837	585,885	121,952
Steamboats ... ..	4,187,598	3,476,791	710,807	3,727,144	3,295,135	432,009
Canals ... ..	168,682	233,348	Dr. 64,666	170,707	219,438	Dr. 48,731
Docks, harbours, and wharves ...	7,469,288	6,461,348	1,007,940	6,864,435	6,185,393	679,042
Hotels, refreshment rooms, and cars	6,068,516	5,492,456	576,060	5,823,475	5,183,449	640,026
Collection and delivery of parcels and goods ...	5,401,009	6,501,706	Dr. 1,100,697	5,167,347	6,075,539	Dr. 908,192
Other separate businesses ...	33,191	85,582	Dr. 52,391	25,335	67,655	Dr. 42,320
Total ... ..	195,427,770	158,966,183	36,461,587	186,469,767	152,182,845	34,286,922
Miscellaneous receipts (net) :-						
Rents (houses, lands, hotels, lump sum tolls, &c.) ... ..			3,447,757			3,425,540
Interest and dividends from investments in other undertakings ... ..			1,004,187			875,602
Transfer fees ... ..			22,927			26,284
General interest ... ..			528,230			532,326
Special items ... ..			482,548			550,957
Total net receipts ... ..			41,947,236			39,697,631
Deduct miscellaneous charges (interest on superannuation funds, chief rents, rent charges, rents of leased undertakings, &c.)			3,262,853			3,170,132
Net revenue for the year ... ..			38,684,383			36,527,499
Balance brought forward from last year's account ... ..			254,196			255,273
Special items ... ..			Dr. 316,161			Dr. 138,004
Appropriation from general reserve ... ..			223			50,557
Amount available for appropriation ... ..			38,622,641			36,695,325



## Silver Jubilee of the Lötschberg Railway

On July 15, 1913, the mountain section of the Berne-Lötschberg-Simplon Railway, from Frutigen to Brigue, was opened to traffic. This was the pioneer line in single phase electric traction for heavy main-line traffic

Schemes for an international line from Berne through the Alps to Italy date back as far as 1857, providing variously for tunnels under the Breithorn, Wildstrubel, Gemmi-Pass, and Lötschberg. A concession for a line from Spiez through the Lötschberg to Visp was granted in 1891, and this was taken over in 1899 by the Canton of Berne, which was closely interested in the scheme. The latter was modified and further developed, and on May 4, 1902, the Cantonal government was authorised by popular votation to grant a subsidy of 25 per cent. of the estimated cost of fr. 70 million. French capital was also forthcoming to promote construction of the new line, and the Berner Alpenbahn Bern-Lötschberg-Simplon was constituted on July 27, 1906, two months after the opening of the first Simplon tunnel. The Spiez-Frutigen section had in the meantime been opened on July 25, 1901, for local traffic.

Construction of the Lötschberg tunnel was described in our issue of

May 1, 1936, on the occasion of the 25th anniversary of its boring, which was completed on March 31, 1911. The whole line from Frutigen to Brigue was formally opened on July 15, 1913, with official ceremonies and festivities at the principal stations, and direct standard-gauge communication was thus established between Berne and the Simplon route to Italy. Incidentally, Kandersteg was given the distinction of being the only important Swiss winter resort to be directly reached from the principal capitals without change of train.

On January 1, 1913, the Lötschberg Company took over the Thunersee Railway (Thun-Interlaken-Bönigen) and the steamer services on the lakes of Thun and Brienz. The system as finally constituted therefore comprised the main line from Thun to Brigue, double-tracked from Thun to Spiez and from Kandersteg through the Lötschberg tunnel to Goppenstein; and the single line from Spiez to Interlaken-Bahnhof, Interlaken-Ost (where

the station is also used by the Bernese Oberland Railways and the Brünig line of the Federal Railways), and Bönigen, where the workshops are situated. The B.L.S. also works several of the so-called "Bernese Decree Railways" (lines built and worked under special guarantees from the Canton of Berne), viz.: the Gürbetal (Berne-Belp-Thun), Berne-Schwarzenburg, Spiez-Erlenbach, and Erlenbach-Zweisimmen lines all single-track. The Gürbetal route is normally used for local traffic only, though for some years an evening express from the Lötschberg route was worked over it and at present a seasonal express to and from Interlaken is routed

this way; otherwise, apart from occasional specials, all main-line traffic uses the Federal double-track line via Münsingen. The Spiez-Zweisimmen line is part of the through route between Montreux, Interlaken, and Lucerne. Finally, the Berne-Neuchâtel Railway is in practice under Lötschberg management.

In order to improve its connections with the French Eastern Railway via Delle, the Berne-Lötschberg-Simplon company opened on October 1, 1915, a section of line entirely isolated from its own system, namely, from Lengnau to Moutier (or Münster), reducing the distance between Bienne (Biel) and Moutier by 15.2 km. as compared with the sinuous and heavily-graded route via Sonceboz. This line is owned and maintained by the Lötschberg company, but traffic is worked by the Federal Railways. A further cut-off, from Grenchen to Dotzigen, on the Lyss-Solothurn line, avoiding the reversal at Bienne, was planned, but has been indefinitely postponed.

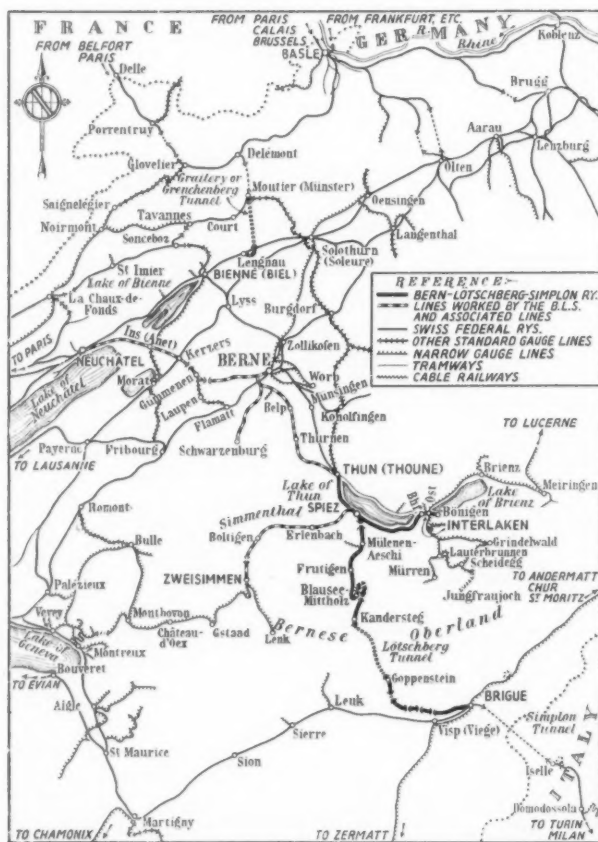
The mileage of the Lötschberg group is as follows:—

	Km.
Bern-Lötschberg-Simplon Railway	117.6
Berne-Neuchâtel Railway	42.9
Gürbetal Railway	34.5
Berne-Schwarzenburg Railway	20.9
Spiez-Erlenbach Railway	11.3
Erlenbach-Zweisimmen Railway	23.6
Total	250.8

The Lötschberg line proper, i.e., the Spiez-Brigue section (74.4 km.), has several unusual features, one being that chaired track is used beyond Frutigen. Tunnels, of which there are 40 in all, are intended for double-track, but except at the ends most of them are only sufficiently excavated to provide clearance for one track. The Frutigen stone viaduct and the Balt-schieder and Bietschtal bridges are among the most notable engineering works, which include also several steel galleries and other protection works against landslides and avalanches. Between Kandergrund and Kandersteg the line makes two zig-zags in the vicinity of the famous Blausee, by means of an open-air loop and a spiral tunnel. Average gradients are 1.74 per cent. (1 in 57) on the Spiez-Kandersteg section and 2.07 per cent. (1 in 48) on the southern approach to the Lötschberg tunnel, with a maximum of 2.7 per cent. (1 in 37). The minimum radius of curves (which represent 55.2 per cent. of the total length) is 300 m., or roughly 15 ch.

### A Pioneer of H.T. Electric Traction

At the time when the Lötschberg line was under construction, no data were available regarding the possibilities of high-tension electric traction for heavy traffic over a severely-graded line with long tunnels. The engineers of the new line were therefore faced with pioneer work, and were handicapped by the necessity of having



Sketch map showing the Lötschberg and associated railways

## NOTES AND NEWS

the electrical equipment in complete working order by the date of opening of the line, although the work had to be done simultaneously with the actual construction of the railway; indeed, on many sections the overhead equipment was in place before the track was laid.

A certain amount of experience had been gained from the experimental engines in service on the Spiez-Frutigen line (though with light traffic only), and particularly from the C-C locomotive (No. 121) built by Oerlikon, which is still in service, though it has become a Berne-Neuchâtel unit. This engine had a maximum tractive effort of 20,000 kg., and on the one-hour rating produced 2,000 h.p. at 50 km.p.h., with a maximum speed of 60 km.p.h. The 13 locomotives for the new line were supplied jointly by Oerlikon and Brown Boveri, and had a capacity of 2,500 h.p. at 50 km.p.h., a maximum speed of 75 km.p.h., and 18,000 kg. tractive effort. These engines, which were of 1-E-1 type, worked the whole of the traffic, with the assistance of some heavy motor-coaches, until 1926, when two engines of a much more powerful design were introduced with a view to handling the heaviest trains without double-heading. The new locomotives were supplied by Sécheron and have individual axle drive; they produce 4,500 h.p. on the one-hour rating, and have a tractive effort of 34,000 kg. Two more of this type were delivered in 1931.

A radical reorganisation of the local services on the Lötschberg system was effected in 1935, when many locomotive-hauled trains were replaced by lightweight railcars incorporating several novel features, chief of which is that the transformer is fitted on the roof of the vehicle, enabling the whole interior space to be used for passenger accommodation. These vehicles—known as "Blue Arrows," being counterparts to the Federal "Red Arrow" railcars—met with great success owing to their higher speed (90 km.p.h.) and greater comfort, and they are extensively used for excursion traffic. They were illustrated in our *Electric Traction Supplement* for December 13, 1935. Finally, in May last three twin-unit streamlined railcars with a maximum speed of 110 km.p.h. were placed in service; as in the case of the single railcars, trailers can be hauled when necessary.

In addition to its ordinary traffic, the Lötschberg line has on several occasions been used by international expresses diverted from the Vallorbe-Lausanne-Simplon route when the latter was temporarily blocked by landslides or floods, and at such times its capacity has been taxed to the utmost.

**ZEPPELIN CENTENARY.**—A Zeppelin exhibition was held at Constance from July 8 to 12, to commemorate the centenary of the birth of Count Ferdinand von Zeppelin.

**Northern Counties Committee (L.M.S.R.) Traffic.**—Traffic receipts of the Northern Counties Committee railways (L.M.S.R.) for the first 26 weeks of 1938 amounted to £169,961, a decrease of £13,542.

**Argentine Railways' Purchase.**—The majority group of the Argentine Chamber of Deputies decided on July 13, according to a Reuters message, to support the Government Bill for the purchase by the State of the British-owned Cordoba Central and Argentine Transandine Railways.

**General Managers of Indian Railways.**—The Railway Board has now changed the designation of the chief executive officer of each of the State Railways from "Agent" to "General Manager." The Agents of company-worked lines are now designated "Agents and General Managers." This change is in accordance with a recommendation in the Wedgwood Committee report.

**Higher Passenger Fares on American Eastern Railways.**—A Reuters message from New York, dated July 6, says that, reconsidering its former negative decision, the Interstate Commerce Commission has authorised an increase in the Eastern railway passenger coach fares from 2 cents to 2½ cents a mile for an experimental period of 18 months. The increase, which means an estimated additional yearly revenue of \$30,000,000 can be made effective at 10 days' notice.

**Metro-Vick Long-Service Awards.**—At the M-V. Club on Monday, July 11, Sir Felix J. C. Pole on behalf of the Metropolitan-Vickers Electrical Co. Ltd., presented each of 105 employees who had completed 35 years' service on December 31, 1937, with a watch or clock. This mark of appreciation was received by three directors and a number of managers of departments as well as by staff and workpeople. The number includes four women employees. The choice of watch or clock was left to the individual, and 46 eight-day Westminster chiming clocks, 56 gold demi-hunter pocket watches, and three wrist watches all suitably inscribed were distributed.

**Aerial Ropeway in America.**—The first passenger ropeway ever built in the United States has been opened at Franconia Notch, New Hampshire, in the White Mountains, says Reuters Trade Service from New York. The line provides a two-car, 5,410-ft. suspension ride from base to peak of Cannon Mountain. It was constructed by the State of New Hampshire, and the work took nine months with a large force of men labouring much of the time in sub-zero weather. The cars carry 27 persons each trip up or down one of the most picturesque peaks in New Hampshire in eight minutes; they travel at 1,000 ft. a minute. The tramway renders accessible the peak of

Cannon Mountain, commanding a splendid view of White Mountain peaks and valleys, which hitherto could be reached only by those able to undertake a two-hour climb on foot up a narrow trail.

**L.N.E.R. Speed Records.**—A slight correction is needed to the caption of the diagram on page 79 of our issue last week. The locomotive concerned in the high speed run of August 27, 1936, was *Silver Fox*, and not *Silver Link*, as stated.

**Saurer Oil Engine Rights.**—The Morris group, controlled by Viscount Nuffield, has acquired the exclusive British rights to work the patents relating to the Saurer oil engine, as built by the S. A. Adolphe Saurer, of Arbon, Switzerland.

**Channel Railway Steamer Delayed.**—During the fierce gale on Friday afternoon last, July 8, the ss. *Rouen*, effecting the day service from Dieppe to Newhaven, had an exceptionally difficult passage, and during the heavy sea grounded off the breakwater at Newhaven. The vessel was refloated with the assistance of tugs and berthed soon after 6 p.m. Passengers were delayed for two hours, but it is understood that the ss. *Rouen* suffered no material damage.

**Non-destructive Testing.**—The Joint Committee on Materials and Their Testing is organising a meeting to be held on November 25 next under the auspices of the Institution of Electrical Engineers for the discussion of the subject of non-destructive testing. The subject has been divided into three sections: Magnetic and Electrical Methods; X- and Gamma-Rays; Acoustical and General Methods, and each section will be dealt with by authors representing respectively, Great Britain, the Continent of Europe, and the United States.

**Clifton & Lowther Station Closed.**—Because of decline in traffic, Clifton & Lowther station, on the L.M.S.R., four miles south of Penrith, was closed on July 4, for both passenger and goods traffic, except that full loads of merchandise and livestock will be dealt with on notice being given. Reference to the decision to close this station was made on page 1128 of our June 10 issue. This is the nearest station to Lowther Castle, until recently the Northern home of Lord Lonsdale, and expresses formerly stopped there for Lord Lonsdale and his guests. The ex-Kaiser was met at Clifton & Lowther when he made his first visit to Lowther Castle nearly forty years ago.

**Transport Exhibition at Cologne, 1940.**—An international convention held in Paris having decided on the holding of an International Transport Exhibition at Cologne in 1940, representatives of the German and foreign press were entertained on June 23, in that city

by the German Ministry of Public Relations. A special commissioner, Dr. Maiwald, has been appointed to manage all matters in connection with the exhibition, and, at the request of Herr Hitler, Dr. Dormüller, the Minister of Transport and General Manager of the Reichsbahn, has become President of it. In his address to the press, the latter dwelt on the importance of transport in modern times and emphasised its essentially international character. Cologne, he added, was well suited to be the site of the undertaking, for it was in the path of several very important currents of traffic, by rail, road, river, and air.

**Improved Facilities at Frodingham and Stainforth, L.N.E.R.**—In connection with developments in the iron and steel industry in North Lincolnshire, certain lines at Frodingham are to be re-arranged, and two existing sidings extended to improve the working arrangements between the main line and the Appleby (Frodingham) Company's extensions. To provide for the additional traffic expected, the capacity

of the marshalling yard at Stainforth is to be increased by groups of eight sidings on the up side of the line and nine sidings on the down side. These additional sorting sidings will hold 700 wagons, and three new reception sidings on the up side and two on the down side will hold another 400 wagons. The loading dock and sidings on the down side at Stainforth are to be extended and proper accommodation for the staff, with additional electric lighting, installed. The total expenditure will be about £50,000.

**Invisible Wire.**—A piece of aluminium wire so fine that it is invisible to the naked eye is being placed on view under a high-powered microscope on the stand of the Aluminium Union Limited in the Canadian Pavilion at the Empire Exhibition, Glasgow. The diameter of this wire is so minute that 600 pieces laid side by side would be equivalent to the thickness of a human hair. Twenty ounces of the wire would encircle the world at the equator, but would cost £101 million. Fine aluminium wires are used in seismic prospecting for oil.

### British and Irish Traffic Returns

GREAT BRITAIN	Totals for 27th Week			Totals to Date		
	1938	1937	Inc. or Dec.	1938	1937	Inc. or Dec.
L.M.S.R. (6,834½ mls.)	£	£	£	£	£	£
Passenger-train traffic...	633,000	626,000	+ 7,000	12,806,000	12,787,000	+ 19,000
Merchandise, &c. ...	435,000	498,000	- 63,000	12,580,000	13,274,000	- 694,000
Coal and coke ...	213,000	219,000	- 6,000	6,951,000	7,118,000	- 167,000
Goods-train traffic ...	648,000	717,000	- 69,000	19,531,000	20,392,000	- 861,000
Total receipts ...	1,281,000	1,343,000	- 62,000	32,337,000	33,179,000	- 842,000
L.N.E.R. (6,315 mls.)						
Passenger-train traffic...	419,000	424,000	- 5,000	8,284,000	8,388,000	- 104,000
Merchandise, &c. ...	286,000	331,000	- 45,000	8,740,000	9,162,000	- 422,000
Coal and coke ...	204,000	230,000	- 26,000	6,592,000	6,780,000	- 188,000
Goods-train traffic ...	490,000	561,000	- 71,000	15,332,000	15,942,000	- 610,000
Total receipts ...	909,000	985,000	- 76,000	23,616,000	24,330,000	- 714,000
G.W.R. (3,737 mls.)						
Passenger-train traffic...	283,000	281,000	+ 2,000	5,305,000	5,361,000	- 56,000
Merchandise, &c. ...	171,000	199,000	- 28,000	5,094,000	5,326,000	- 232,000
Coal and coke ...	96,000	106,000	- 10,000	2,989,000	3,055,000	- 66,000
Goods-train traffic ...	267,000	305,000	- 38,000	8,083,000	8,381,000	- 298,000
Total receipts ...	550,000	586,000	- 36,000	13,388,000	13,742,000	- 354,000
S.R. (2,148 mls.)						
Passenger-train traffic...	389,000	393,000	- 4,000	8,177,000	8,220,000	- 43,000
Merchandise, &c. ...	59,000	65,500	- 6,500	1,627,000	1,672,000	- 45,000
Coal and coke ...	21,000	23,500	- 2,500	822,000	852,000	- 30,000
Goods-train traffic ...	80,000	89,000	- 9,000	2,449,000	2,524,000	- 75,000
Total receipts ...	469,000	482,000	- 13,000	10,626,000	10,744,000	- 118,000
Liverpool Overhead ...	1,375	1,383	- 8	36,578	34,086	+ 2,492
Mersey (4½ mls.) ...	4,080	3,955	+ 125	116,975	112,784	+ 4,191
*London Passenger Transport Board ...	569,800	561,900	+ 7,900	1,153,300	1,144,300	+ 9,000
IRELAND						
Belfast & C.D. pass. ...	3,371	3,179	+ 192	55,843	58,455	- 2,612
" " goods ...	448	475	- 27	11,563	13,488	- 1,925
" " total ...	3,819	3,654	+ 165	67,406	71,943	- 4,537
Great Northern (543 mls.) pass. ...	13,750	13,250	+ 500	252,400	253,100	- 700
" " goods ...	7,650	9,300	- 1,650	235,300	256,250	- 20,950
" " total ...	21,400	22,550	- 1,150	487,700	509,350	- 21,650
Great Southern (2,076 mls.) pass. ...	45,724	46,363	- 639	867,564	859,224	+ 8,340
" " goods ...	37,233	35,598	+ 1,635	1,051,722	1,115,628	- 63,906
" " total ...	82,957	81,961	+ 996	1,919,286	1,974,852	- 55,566

\* 2nd week (before pooling)

### British and Irish Railway Stocks and Shares

Stocks	Highest 1937	Lowest 1937	Prices	
			July 13, 1938	Rise, Fall
G.W.R.				
Cons. Ord. ...	67½	55½	45	-2
5% Con. Prefce. ...	127	108	111½	+1½
5% Red. Pref. (1950) ...	113	109	109½	-
4% Deb. ...	113½	102½	109½	+1½
4% Deb. ...	118	106	110½	+1
4% Deb. ...	124½	112	115½	-
4% Deb. ...	136½	122½	130½	+3½
2½% Deb. ...	76	64	67½	-
5% Rt. Charge ...	133½	118	127½	+2
5% Cons. Guar. ...	133½	116½	127½	+1
L.M.S.R.				
Ord. ...	36½	25½	15½	-1
4% Prefce. (1923) ...	82½	65½	45½	-1
4% Prefce. ...	92½	77½	65½	-1
5% Red. Pref. (1955) ...	107½	102	93½	-
4% Deb. ...	108	99½	105	+1½
5% Red. Deb. (1952) ...	117½	111	112½	+1
4% Guar. ...	104	95½	100	+1½
L.N.E.R.				
5% Pref. Ord. ...	12½	6½	4½	-¼
Def. Ord. ...	6¼	3½	2½	-¼
4% First Prefce. ...	79½	63	43	-2
4% Second Prefce. ...	31½	21	13½	-1½
5% Red. Pref. (1955) ...	101½	89½	73½	-1½
4% First Guar. ...	103	91½	92	+1½
4% Second Guar. ...	97½	85½	82	+1½
3% Deb. ...	84½	74	78	+1½
4% Deb. ...	107½	98½	103½	+2
5% Red. Deb. (1947) ...	113½	106½	109½	-
4½% Sinking Fund Red. Deb. ...	110½	105½	107	+1½
SOUTHERN				
Pref. Ord. ...	98½	83½	68	-1
Def. Ord. ...	27½	16½	16	-1
5% Pref. ...	126½	105½	109½	+1½
5% Red. Pref. (1964) ...	118	110½	113½	+2
5% Guar. Prefce. ...	133½	116½	126½	+1
5% Red. Guar. Pref. (1957) ...	118½	111½	115	-
4% Deb. ...	112	101½	108	+2
5% Deb. ...	135½	123½	127½	+2
4% Red. Deb. ...	113	105	107	-
1962-67				
BELFAST & C.D.				
Ord. ...	5	4	4	-
FORTH BRIDGE				
4% Deb. ...	106	99½	100½	+1
4% Guar. ...	105½	99	99½	-
G. NORTHERN (IRELAND)				
Ord. ...	11	5	3½	-¾
G. SOUTHERN (IRELAND)				
Ord. ...	50	21½	20	-
Prefce. ...	61	34	19	-
Guar. ...	94½	69½	48	-
Deb. ...	95	82½	71½	+1½
L.P.T.B.				
4½% "A" ...	123½	110½	117½	+1
5% "A" ...	135	121½	128½	+1
4½% "T.F.A." ...	108½	104	106	-
5% "B" ...	125	114½	118½	-
4% "C" ...	99½	75	76	+1
MERSEY				
Ord. ...	42½	22	18	-
4% Perp. Deb. ...	103	96½	101	-
3% Perp. Deb. ...	77½	74½	74½	-
3% Perp. Prefce. ...	68½	61½	65	-



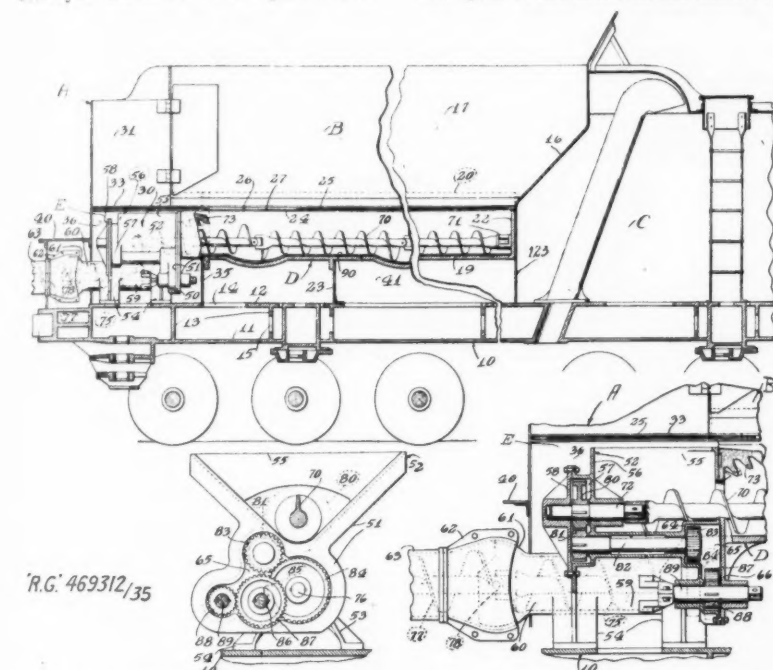
## ABSTRACTS OF RECENT PATENTS\*

**No. 469,312. Mechanical Conveyors for Tenders**

*The Standard Stoker Co. Inc., of 350, Madison Avenue, N.Y.C., N.Y., U.S.A. (Filed November 18, 1935.)*

In locomotive tenders having a fuel conveyor mounted in a separate com-

partment formed between the usual fuel and water compartments, the gearing through which the conveyor is driven has been mounted at the back of the tender; but, this arrangement, the present inventors contend, materially reduces the space available for water and complicates the construction and maintenance of the tender and of the conveyor. To overcome these disadvantages, it is now proposed to mount all the driving parts for the conveyor at the front end of the tender and externally to the water compartment. According to one construction, the conveyor worm 70 is arranged in a compartment B below the fuel compartment C and above a chamber formed by the walls 19, 35, 11, 10 and 123, and communicating with the compartment C.

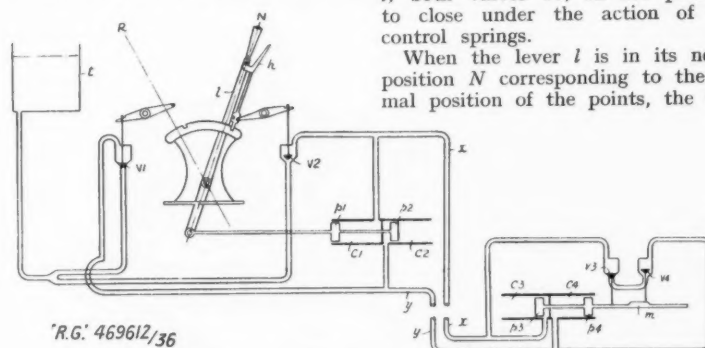


partment formed between the usual fuel and water compartments, the gearing through which the conveyor is driven has been mounted at the back of the tender; but, this arrangement, the present inventors contend, materially reduces the space available for water and complicates the construction and maintenance of the tender and of the conveyor. To overcome these disadvantages, it is now proposed to mount all the driving parts for the conveyor at the front end of the tender and externally to the water compartment. According to one construction, the conveyor worm 70 is arranged in a compartment B below the fuel compartment C and above a chamber formed by the walls 19, 35, 11, 10 and 123, and communicating with the compartment C.

The gear driving mechanism for the conveyor system is located at the front end of the tender and all gears are in a casting within the compartment E and entirely without the water compartment. The screw 70 is driven from its forward end by means of the shaft 72. This shaft carries the gear 80 which

turn engages the gear 85 mounted on the shaft 86. On the same shaft 86 is mounted the gear 87 which engages the gear 88 mounted on the power shaft 89.

The power shaft can be driven from either end from any suitable prime mover such as by a two-cylinder double-



acting reversible steam engine mounted in the locomotive, or, if preferred, mounted in the tender directly connected with either end of the power shaft. If the stoker engine is mounted

on the tender it would be desirable to enlarge the compartment E by extending it laterally into one of the bulkheads, or extending the compartment further back in the tender.—(Accepted July 19, 1937.)

**No. 469,612. Hydraulically-operated Railway Points and Signals**

*The Railway Signal Co. Ltd., and others, of 40, Broadway, Westminster, S.W.1. (Application filed January 29, 1936.)*

According to this invention it is proposed to operate railway points and signals by means of a two-pipeline hydraulic control apparatus having a reservoir connected at some predetermined positions so as to allow the liquid to breathe and to recover loss by leakage, &c. Such apparatus in its previously known forms had the disadvantage that a partial vacuum was created, before the connection with the reservoir was established, and any air entering the pipelines rendered the operation inaccurate. It is an object of the present invention to overcome this disadvantage by ensuring that each pipeline x, y, is continuously connected with the reservoir t through a retaining valve v1, v2, permitting liquid to flow from the reservoir t into the pipeline x, y, and additionally permitting the reverse flow of liquid between at least one of the pipelines and the reservoir at each of the two extreme positions R, N of the control lever l.

In the system illustrated the two pipelines x, y are each provided with a spring-controlled non-return valve v1, v2 permitting the flow of liquid from the reservoir t to the pipeline, one of these valves being arranged to be held open when the catch handle h of operating lever l is released, while when the catch handle h is operated to permit the movement of the lever l, both valves v1, v2 are permitted to close under the action of their control springs.

When the lever l is in its normal position N corresponding to the normal position of the points, the valve

v1 corresponding to the pipeline y through which liquid was supplied to effect the setting of the points to this position is permitted to close while the other valve v2 is held open. When, however, the operating lever l is in its reverse position R the conditions of the two valves v1, v2 are reversed.

The two pipelines x, y are provided with similar spring-controlled non-

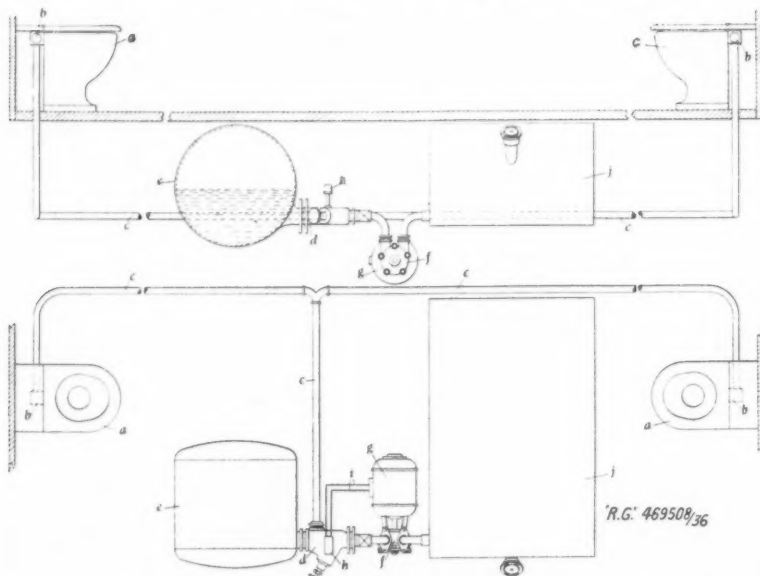
\* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. Group abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2. either sheet by sheet as issued, on payment of a subscription of 5s. a group volume, or in bound volumes, price 2s. each, and the full specifications can be obtained from the same address price 1s. each.

return valves *v3*, *v4* adjacent to the points to be operated, communication between the two pipelines *x*, *y*, beyond the operating cylinders *c3*, *c4* being effected through the valves *v3*, *v4* in series with one another in the following manner. During the movement of the points from their full normal to their full reverse position or *vice-versa*, both the valves *v3*, *v4* are permitted to close under the action of their control springs so that communication between the pipelines *x*, *y* through the valves is prevented. So long as the points are in their full normal position the valve *v4* communicating with the pipeline *y* through which liquid was supplied to set the points to normal is held open, the other valve *v3* being permitted to close, these conditions being reversed when the points are in their full reverse position. The open valve *v4* is permitted to close upon the initial movement of a point operating member *m* actuated by the pistons *p3*, *p4* from either of their extreme positions to an extent which is insufficient to unlock the points and it will thus be seen that any attempt to displace the points except by the operation of the lever *l* will be prevented by the closure of the valves *v3*, *v4* adjacent to the points.—(Accepted July 29, 1937.)

#### No. 469,508. Water Closets

*J. Beresford & Son Ltd., and R. S. Guinness, of Cato Street Works, Birmingham, 7. (Filed May 19, 1936.)*

To economise in the quantity of water necessary for use in water closets on trains, there is provided according to the present invention, a system having a pressure tank *e* which is



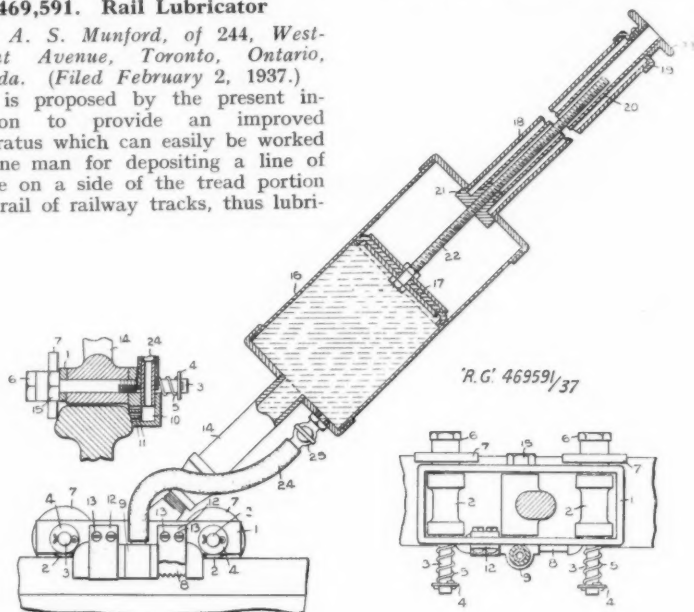
automatically replenished from a storage tank *j* by a pump *f*, the motive power of which is responsive to the pressure in the tank *e*. The motive power is an electric motor *g*,

controlled by an automatic switch *h* which is itself controlled by the pressure in the tank *e* in a manner such as to start or stop the motor when the pressure falls below or rises to predetermined values.—(Accepted July 27, 1937.)

#### No. 469,591. Rail Lubricator

*T. A. S. Munford, of 244, Westmount Avenue, Toronto, Ontario, Canada. (Filed February 2, 1937.)*

It is proposed by the present invention to provide an improved apparatus which can easily be worked by one man for depositing a line of grease on a side of the tread portion of a rail of railway tracks, thus lubri-



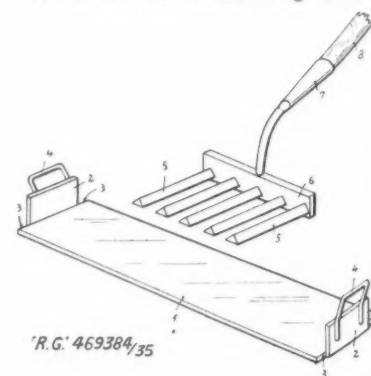
cating the tread portion side and rolling stock wheel flanges, and preventing the wear which occurs especially on curves. One form of the apparatus is shown in the drawing. The rail head is gripped between spring-loaded

holes 11 on to the side of the rail where it is spread by the leather as the apparatus is pushed along the rail by a trackman.—(Accepted July 28, 1937.)

#### No. 469,384. Device for Distributing Ballast

*G. Lamblin, of 89, rue de la Carnoy, Lambersant, Nord, France. (Filed December 19, 1935.)*

A device for distributing ballast



beneath sleepers, and for raising them, consists of a fork having teeth 5 of triangular cross-section which is used in combination with a tray 1 having two upstanding end plates 2 which are narrower than the tray 1 and therefore leave overhanging parts 3 so that when the two parts 2 rest against the side of a sleeper the part 3 may pass

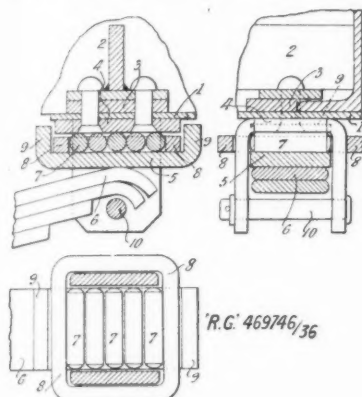
under it. The ballast material is placed on the tray and pushed under the sleeper by means of the fork, which sleeper need be raised only about an inch.—(Accepted July 19, 1937.)

#### No. 469,746. Leaf Spring Supports

D. R. M. Yates, O.B.E., of Highclere, Chislehurst, Kent. (Filed February 3, 1936.)

An improved connection is proposed, between the end of a leaf spring 6 and the solebar 1 of a vehicle, in which the solebar 1 carries one race 4 of a

roller bearing, the other race 5 bearing upon the top leaf of the spring 6. The rollers 7 are confined in a cage 8 which when load is applied to the spring, slides with the rollers 7 on the lower race 5. With this arrangement, longitudinal movement of the individual leaves consequent to flexing of the spring 6 causes the cages of the races to slide relatively to the solebar, there being no relative movement between the top leaf and the lower race. By this means, it is claimed that friction between the ends of the top leaf and the lower race is considerably reduced.—(Accepted, July 30, 1937.)



#### COMPLETE SPECIFICATIONS ACCEPTED

469,176. Bailey, R. End door fastener on railway vehicles such as mineral and goods wagons.

469,248. Ramos, C. R., and Bolanos, M. M. Railway vehicle wheels and guiding arrangements therefore.

469,247. Simpson, J. W. L. Operating mechanism for soot-blowers and the like.

469,307. Tennant, W. J. (Cincinnati Motor Terminal Company). Freight containers.

369,316. Lamblin, G. Means for supporting apparatus used for the maintenance of railway tracks.

369,312. Triggs, W. W. Locomotive tenders and stokers.

369,339. A.G. Brown Boveri & Cie. Dust separators for furnaces.

369,343. Milbourne, S. M., and Franks, F. Apparatus for breaking or cutting coke, coal, and similar substances.

369,384. Lamblin, G. Means for distributing ballast beneath and raising railway track sleepers.

469,164. Friedmann, L. (trading as Friedmann, A. (Firm of)). Devices for preventing the escape of oil from railway vehicles.

469,656. Vereinigte Spielwaren Fabrikanten A. Fortner and J. Haffner's Nachfolger Gesellschaft, and Kahn, S. Electrical railway toy.

469,612. Roberts, W. S., Burton, J. H., and Railway Signal Co. Ltd. Apparatus for operating railway points and signals and the like.

469,570. Strong, F. G. Signal or alarm devices for small scale or model rail traction systems.

469,591. Munford, T. A. S. Railway rail lubricators.

469,687. Heacock, F. H., Haigh, D., and London Passenger Transport Board. Vehicle bodies.

469,746. Yates, D. R. M. Leaf springs.

469,502. Accles & Pollock, Limited and Henderson, L. B. Construction of coach and other vehicle bodies.

469,508. Beresford & Son Ltd. and Guinness, R. S. Water-closet systems.

## A 100,000-Ton Blast

(See illustrations on page 130, and editorial note on page 105)

On Tuesday last, July 12, one of the largest blasts ever made in this country was detonated at Caldon Low quarries, Staffordshire, over a land-line nearly 150 miles long, by Lord Stamp, Chairman of the L.M.S.R., who was seated in the Shareholders' Meeting Room, Euston station, London. Approximately 100,000 tons of limestone were dislodged. Caldon Low limestone is one of the hardest found in Great Britain, and has a crushing stress of 31,000 lb. per sq. in. It is used for furnace stone and chemical purposes, railway ballast, concrete aggregate, limestone powder for chemical purposes, and tar macadam for road construction, and the quarry plant is capable of producing about 1,500 tons a day. The quarries have been worked at least since 1776, in which year the Trent & Mersey Navigation Company secured powers to build a branch canal to Froghall and a railway thence to the quarries. We refer to the historical interest of this very early railway in an editorial note on page 105. In 1841 the quarrying operations were taken over by the canal company, which six years later was absorbed by the North Staffordshire Railway Company. That railway (and since grouping in 1923 the L.M.S.R.) continued to work the quarries until 1934, when a lease was granted to Hadfields (Hope & Caldon Low Quarries) Limited, a subsidiary under-

taking of Derbyshire Stone Limited. On Tuesday last a distinguished company, including representatives of the press, was afforded the opportunity of seeing the blast. Loud-speaker telephonic communication was established between Euston station and the quarry, and Lord Stamp was therefore enabled to make some introductory remarks from Euston station, which were heard by the company at Caldon Low. In the course of these he announced that a suitable piece of limestone from the blast would be used by the L.M.S.R. to form a foundation stone for the new Euston station. Major Owen Hart, Chairman of the quarry company, replied, and at a given signal Lord Stamp depressed the key which fired the charge. Some illustrations of the quarry and the actual operations are reproduced on page 130. One of these views shows Sir Francis Joseph, a Director of the L.M.S.R., selecting a suitable block for the new Euston station foundation stone. Although the Caldon Low quarries are no longer worked by the L.M.S.R., the railway company retains the ownership and is also a large customer of the quarry company for limestone ballast for permanent way, normally to the extent of about 40,000 tons per annum.

The method of blasting to produce so large a quantity of stone as 100,000 tons is by tunnelling into the face of

the quarry; the height of face affected was between 130 and 145 ft., and the length approximately 150 ft. The tunnels are driven with the use of a light rock drill which drills groups of short holes to a depth of about 21 in. for each round of holes. The tunnel section is about 4 ft. 6 in. by 2 ft. wide. The tunnels are driven in with at least two right-angle bends to a distance of about 40 ft. from the face, and two galleries are then driven approximately 50 ft. long horizontally and parallel with the face. The total length of tunnels driven for this blast, therefore, amounted to 280 ft. and in these headings a total charge of 10 tons of black powder was placed. The headings and tunnels were then filled up solidly with hand-placed stone. A double firing-circuit was laid consisting of one electrical circuit and one circuit of high-speed fuse. This precaution is taken to eliminate any chance of misfire.

On this particular occasion the arrangements for the firing switch to be closed by Lord Stamp included the provision of a land-line between Euston and Caldon Low so as to operate an electrical relay at the quarry, which, in turn, closed the circuit between the supply mains and the cable taking the current to the heading circuit. All these arrangements were carried out under the direction of Mr. A. F. Bound, Signal and Telegraph Engineer, L.M.S.R. The co-operation between the quarry company and the L.M.S.R. was the responsibility of Major W. H. C. Clay, Estate Manager, L.M.S.R.



## CONTRACTS AND TENDERS

### Coaches for Iraq

The Birmingham Railway Carriage & Wagon Co. Ltd. has received orders from the Crown Agents for the Colonies for a total of 35 all-steel coaches for the 4 ft. 8½ in. gauge lines of the Iraq State Railways as follows:—20 third-class coaches; six first-second class, air-conditioned coaches; three first-second-buffet air-conditioned coaches; four third-brake coaches; one reserved saloon, air-conditioned, and one reserved saloon, not air-conditioned.

J. Stone & Co. Ltd. is to supply the air-conditioning equipment for the above coaches for Iraq.

The English Electric Co. Ltd. has received important contracts from the London Passenger Transport Board in connection with the electrification of the board's Northern Line extension to Elstree. The contracts comprise ten supervisorily controlled rectifier substations and include 21-1,500 kW. steel-tank mercury-arc rectifiers, 11 kV. switchgear, power transformers, d.c. switchgear, low-tension a.c. switchgear, remote supervisory control gear, and cables.

### Harrow to Rickmansworth Widening, L.P.T.B.

Sir Robert McAlpine & Sons (London) Limited has received a contract from the London Passenger Transport Board, as part of the board's £8,000,000 North-West London railway scheme, for earthworks, retaining walls, and bridge abutments on the Metropolitan Line between Harrow-on-the-Hill and Rickmansworth. This work, which will cost £160,000, will enable the existing double line to be widened to four tracks between Harrow and Rickmansworth. With this new facility, and the electrification of the line between Rickmansworth, Amersham, and Chesham, the exchange of electric and steam locomotives on London Transport trains at Rickmansworth will no longer be necessary and five or six minutes will be saved on the journey between Baker Street and outlying stations.

United Steel Cos. (India) Ltd. has received an order from the Indian Stores Department for 57 steel tyres and eleven crank axles.

Alfred Herbert (India) Limited has received orders from the Indian Stores Department for machine tools as follow:—

- Eleven sliding and surfacing brass-finishers' lathes.
- Six sliding, surfacing, and screw-cutting gap bed lathes.
- Two sliding, surfacing, and screw-cutting straight bed lathes.
- One precision tool room lathe
- One capstan lathe.
- One horizontal spindle surface grinding machine.
- One twist drill grinding machine.
- One geared single action, inclineable, open front power press.
- Two electric melting furnaces.
- One electric tinning bath.
- One 24-in.-stroke improved high-speed shaping machine.

D. Wickham & Co. Ltd. has received a repeat order from the Buenos Ayres Great Southern Railway for 12 petrol-driven, Jap-engined gang trolleys.

### Wagons for L.N.E.R.

The L.N.E.R. has placed orders for 1,000 covered wagons for the conveyance of fish traffic. The orders are divided in equal quantities of 250 each between the following firms: Birmingham Railway Carriage and Wagon Co. Ltd., Hurst Nelson & Co. Ltd., Metropolitan Cammell Carriage and Wagon Co. Ltd., and Chas. Roberts & Co. Ltd. The wagons are to be fitted with automatic brake gear and are intended for service on the express fish trains from Aberdeen, Hull, and Grimsby to Billingsgate market.

It is reported that Hurst Nelson & Co. Ltd. has also received an order for 21 tank wagons from Imperial Chemical Industries Limited.

The Bengal-Nagpur Railway Administration has placed the following orders:—  
Colvilles Limited: Six steel boiler plates.  
Hulberd Patents Limited: Quantity of copper joint rings.  
Superheater Co. Ltd.: Superheater elements and headers.

The Deutsche Getriebe G.m.b.H. has received an order for 25 Mylius mechanical transmissions for installation in 150-b.h.p. diesel shunting locomotives for the Roumanian State Railways.

The Soc. Commerciale d'Ougrée has received an order from the Peruvian Corporation for 800 tons of 80 lb. per yard steel rails and a quantity of fish-plates.

The Associated British Machine Tool Makers Limited has received the following orders for machine tools from the Indian Stores Department:—

- One 26-in. stroke double traverse head shaping machine.
- Two spiral electric planing machines.
- One vertical milling machine.
- One high-production slotter.
- One sliding, surfacing, and screw-cutting lathe.
- One brass-finisher's turret lathe.
- Two combination turret lathes.
- One precision tool room lathe and two sensitive drilling and tapping machines.

Wm. Beardmore & Co. Ltd. has received an order from the Assam-Bengal Railway Administration, to the inspection of Messrs. Rendel, Palmer & Tritton, for 300 carriage and wagon axles.

Allmaenna Svenska Elektriska Aktiebolaget (ASEA) has obtained orders to a total value of Kr. 8,000,000 in connection with the electrification of the section between Gothenburg and Amål on the Bergslagen Railway and the Dalsland Railway, learns Reuters Trade Service from Stockholm. About Kr. 5,000,000 or Kr. 6,000,000 of the total value of the order is for electric locomotives. Deliveries will begin next October and be completed in about a year.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Miscellaneous Section), Simla, receivable by August 3, for the supply of glass sheets required by the E.B., E.I., G.I.P., and N.W. Railways.

The Indian Stores Department is calling for tenders (Order No. N. 9385) for the supply and delivery of 100 steel tyres for locomotives, with flanged stud fastening and for HG, HG/S, HG/C, and HG/G classes. Tenders must reach the Indian Stores Department, Engineering Branch, Simla, by July 27.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Engineering Section), Simla, receivable by August 10, for the supply of:—

- One double-headed locomotive horn cheek grinder.
- One gear planing or hobbing machine, belt driven.
- One nut forging machine.
- One forging machine for heading bolts from round bar.
- One forging machine for heading rivets from round bar.
- Two electric tyre heaters, 1 ft. 4 in. to 3 ft., and 3 ft. to 6 ft. inside diameters.
- Two heavy radial drilling machines.
- Two automatic vertical spindle slot and keyway drilling machines.
- One double-spindle nut milling and facing machine.
- Three portable jolt squeeze moulding machines.
- One universal oxygen cutting machine.
- One horizontal shaft grinding machine for locomotive piston valve rods.

After July 25 next the address of the Institution of Structural Engineers will be changed from No. 10 to No. 11, Upper Belgrave Street, London, S.W.1. The telegraphic address and telephone number will remain unaltered.

## Forthcoming Meetings

- July 15 (Fri.)—**Chemin de fer de Charleroi à la Frontière de France** (Ordinary General), Charleroi, at the company's headquarters (Bureau de l'Exploitation Nord-Belge) at 12.15 p.m.
- July 18 (Mon.)—**Leopoldina Railway Co. Ltd.** (Annual), Southern House, Cannon Street, E.C.4, at 12 noon.
- July 20 (Wed.)—**Bombay, Baroda & Central India Railway Company** (Annual), Southern House, Cannon Street, E.C.4, at 1 p.m.
- July 20 (Wed.)—**Bolivar Railway Co. Ltd.** (Annual), 117, Old Broad Street, E.C.3, at 12 noon.
- July 20 (Wed.)—**Dorada Railway Co. Ltd.** (Annual), Dashwood House, Old Broad Street, E.C.3, at 2.30 p.m.
- July 20 (Wed.)—**La Guaira & Caracas Railway Co. Ltd.** (Annual), Dashwood House, Old Broad Street, E.C.3, at 12 noon.
- July 22 (Fri.)—**Egyptian Delta Light Railways Limited** (Annual), Winchester House, Old Broad Street, E.C.3, at 12 noon.

## Forthcoming Events

- Sept. 15-24.—Model Engineer Exhibition, at Royal Horticultural Hall, Vincent Square, London, S.W.1.
- Sept. 19-23.—International Management Congress, at Washington, U.S.A.
- International Rail Assembly, at Düsseldorf, Germany.

## OFFICIAL NOTICES

## The Institute of Transport Examinations, 1939

**NOTICE IS HEREBY GIVEN** that the Graduateship and Associate Membership Examinations will be held in London and at other centres on Thursday, Friday and Saturday, April 27th, 28th and 29th, 1939.

The latest date for the deposit of forms of entry is March 1st, 1939 (January 1st if any exemptions are claimed). Full particulars, previous question papers (price 1s. per set, post free) and copies of a revised and enlarged edition of the booklet "The Institute of Transport Examinations: notes for the guidance of candidates unable to attend preparatory courses" (price 2s. 6d. post free) may be obtained from the undersigned.

By Order of the Council,  
A. WINTER GRAY,  
Secretary.

15, Savoy Street,  
London, W.C.2.

## No. 434,296 "Improvements in Conveyances for Transporting Railway Cars and the like by Road."

**THE** Owners of the above Patent are desirous of arranging by licence or otherwise, on reasonable terms, for the manufacture and commercial development of the invention. For particulars, address in the first instance to: HERBERT HADAN & Co., 31 and 32, Bedford Street, Strand, London, W.C.2.

**THE** Proprietors of the Patent No. 390,953 for "Improvements in or relating to Wheels, especially for Railway and other Similar Vehicles" are desirous of entering into arrangements by way of licence and otherwise, on reasonable terms, for the purpose of exploiting the same and ensuring its full development and practical working in this country. All communications should be addressed in the first instance to: HASSETT LANE & Co., 28, Southampton Buildings, Chancery Lane, London, W.C.2.

## South Indian Railway Company, Limited

**THE** Directors are prepared to receive Tenders for the supply of:—  
1. COPPER PLATES.  
2. STEEL TYRES.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Company Limited, marked "Tender for Copper Plates," or as the case may be, with the name of the firm tendering, must be left with the undersigned not later than 10 a.m. on Friday, the 22nd July, 1938, in respect of Specification No. 1 and not later than 12 Noon on Friday, the 5th August, 1938, in respect of Specification No. 2.

The Directors do not bind themselves to accept the lowest or any Tender.

A charge, which will not be returned, will be made of 5s. for each copy of each Specification.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, Westminster, S.W.1.  
E. A. S. BELL,  
Managing Director.

91, Petty France,  
Westminster, S.W.1.  
13th July, 1938.

**APPLICATIONS** are invited for permanent position of Assistant District Engineer in Midlands, in Civil Engineer's Department of Main Line Railway. Applicants should be members of the Institution of Civil Engineers or hold a degree in Engineering in one of the recognised Universities in this Country, and should possess knowledge of effect and methods of dealing with coal workings under running tracks. Maximum salary, £550 per annum. Applicants should give particulars of age, qualifications and experience.—Reply to Box 137, THE RAILWAY GAZETTE, 33, Tothill Street, London, S.W.1.

## THE MADRAS &amp; SOUTHERN MAHRATTA RAILWAY COMPANY LIMITED invite

Tenders for:—  
12 SPANS OF 300 FEET FOR STRENGTHENING FLOOR OF KISTNA BRIDGE.

Specification and Form of Tender can be obtained from the Company's Offices, 123, Victoria Street, Westminster, London, S.W.1.

Fee ONE GUINEA, which will not be returned.

Tenders must be submitted not later than 2 o'clock p.m. on TUESDAY, 9th AUGUST, 1938.

The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,  
V. CRASTER,  
Secretary.

**THE** Owners of Patent No. 392,050, which relates to Guards for Crossing Highways and Railway Level Crossings, wish to enter into negotiations either for the grant of licences or for the sale of the patent. Enquiries should be addressed in the first place to: ANDREWS & BYRNE, 329, High Holborn, London, W.C.1.

**WANTED.**—Assistant Works Manager for large firm of Locomotive Manufacturers. Applicants should be of good education and address, under 30 years of age. Reply in confidence stating age, full particulars of education, training, subsequent experience and salary required to: Box No. 2422, c/o Browns, 37, Tothill Street, London, S.W.1.

**OFFICIAL ADVERTISEMENTS** intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—The Railway Gazette, 33, Tothill Street, Westminster, London, S.W.1.

## RAILWAY AND OTHER MEETINGS

## Great Southern of Spain Railway Co. Ltd.

The ordinary general meeting of the Great Southern of Spain Railway Co. Ltd. was held at 2, Broad Street Place, E.C.2, on July 11, Mr. C. H. Pearson, Chairman, presiding. The Secretary (Mr. F. P. Higgs) read the notice convening the meeting and the auditors' report. The Chairman, in moving the adoption of the report and accounts, referred to the civil war in Spain, and said that 22 months had elapsed since the taking over of the company's undertaking and property by the Workers' Council. No direct news had been received from the zone of the railway since that time and no information was available as to the condition of the property. As explained in the directors' report, a decree issued in Valencia on October 21, 1937, provided for the formation of a national railway system, and for the assets and liabilities of the undertakings taken over, to pass to the State. The terms of this decree could only be interpreted as tantamount to the confiscation of the property of the railway companies concerned. A general caveat against the expropriation of British property without adequate compensation was entered by His Majesty's Minister at Valencia, and protests were lodged with the authorities at Madrid. In the absence of particulars from Spain the balance-sheet could not be taken as representing the real position of the company's affairs. The loss for the year, including

charges for accrued debenture interest, amounted to £11,763, and the accumulated debit balance now stood at £146,531.

Meetings of the first mortgage and income debenture stockholders were held after the general meeting, and a scheme of arrangement was approved, under which the holders of the first mortgage debenture stock agree to the further postponement of the payment of the interest and in respect of the years 1938 and 1939, empowering also the extension of the new moratorium period to include the years 1940 and 1941. At the same time the directors were authorised to borrow a sum not exceeding £20,000, to be charged in priority on the undertaking, in order to provide funds for the prosecution of the company's claims as and when opportunity presents itself.

## Questions in Parliament

## North and Central China Railways

Mr. I. C. Hannah (Bilston—C.), on July 11, asked the Prime Minister whether his attention had been drawn to the official announcement that the Japanese Government had presented basic shares in the railways of North and Central China to Japanese charter companies to the value of 38,000,000 yen; and whether, as such shares would have priority over the British

capital invested in those lines, he would protest against such action.

Mr. R. A. Butler (Under-Secretary of State for Foreign Affairs): The charter companies will not be formed until October and their prospectuses are still in draft. Draft articles of association, according to the Japanese press, provide that the Japanese Government shall subscribe 175 million yen, which is half of the total capitalisation of the North China Company, and 50 million yen, which is half of the total capitalisation of the Central China Company, and that of these amounts 30.5 million yen for the Central China Company shall, for example, be in the form of railway rolling stock.

## Uganda-Kenya Railway

Mr. A. Creech Jones (Shipley—Lab.), on July 7, asked the Secretary of State for the Colonies whether the finances and incidence of liability as between the Imperial and Kenya Government in respect to the Uganda-Kenya Railway would come under review this year; and whether a statement on the matter would be made.

Mr. Malcolm MacDonald (Secretary of State for the Colonies): The answer to each part of the question is in the affirmative.

## Parliamentary Note

## Royal Assents

The Royal Assent was given on July 13 to the following among other Acts of 1938:—Road Haulage (Wages); London & North Eastern Railway; Southern Railway.

## Railway Share Market

The stock and share markets have continued to move closely with the day-to-day fluctuations of Wall Street. At the beginning of the week there was a check to the upward movement in values, but earlier losses were regained. Stocks of the Home railways, however, were dull and uncertain owing to the general disposition to await the interim dividend statements which commence on Thursday next with that of the Southern. Subsequently the preferred ordinary stock of the latter railway had a fairly steady appearance on hopes that the interim payment will be maintained at 2 per cent., and it is being pointed out that at the current price of 68 a large and over-generous yield is offered.

Moreover, there is a reasonable possibility that the full 5 per cent. dividend will be forthcoming this year. Southern deferred was also relatively steady, but the price has declined on balance, and

dealings this week have been around 16. Following the traffic figures for the past week L.N.E.R. second preference declined to 13½ and the first preference to 44. The market is doubtful if any interim payment will be forthcoming on the first preference stock, although it is realised that the gross traffic figures may give only a very rough indication as to the actual position. Great Western has fallen to 45, at which the yield would work out at fully 6½ per cent., assuming the dividend were reduced to 3 per cent. L.M.S.R. ordinary moved down to 15½. The 4 per cent. first preference was fairly steady around 66, but in the case of the 4 per cent. 1923 preference a fair amount of selling was reported, and the price declined to 45. Guaranteed and debenture stocks were inclined to show fractional losses, particularly those of the L.N.E.R. But this was attributed to the trend of Government securities earlier in the week, and it was reported

that very little selling has been in evidence. Elsewhere, London Transport "C" was firm at 76 in response to current dividend estimates.

Argentine railway securities were inactive and moved to lower levels, although the ordinary stocks were inclined to respond to any improvement in surrounding market conditions. Sentiment has been affected by the substantial decline in traffic for the year ended June and by doubts whether receipts will develop a better tendency during the next few months. Debentures were little changed, except in the case of B.A. and Pacific, but lower prices ruled for the preference stocks, including B.A. Gt. Southern 5 per cents and 6 per cents. San Paulo and other Brazilian railway stocks have not moved against the general trend. American railway stocks were lower on balance and Canadian Pacific reflected the poor traffic figures.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1937-38	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffic to Date			Shares or Stock	Prices						
			Total this year	Inc. or Dec. compared with 1937		Totals		Increase or Decrease		Highest 1937	Lowest 1937	July 13 1938	Yield % (See Note)			
						This Year	Last Year									
South & Central America	Antofagasta (Chili) & Bolivia	834	10.7.38	10,530	-	3,600	28	436,830	454,520	-	17,890	Ord. Stk.	29	1014	11	Nil
	Argentine North Eastern	753	9.7.38	10,515	+	782	12	13,927	13,573	+	354	A. Deb.	1514	6	6	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	—	—	9312	60	80	5	Nil
	Bolivar	174	June, 1938	3,550	-	2,150	26	22,600	35,000	-	12,400	4 p.c. Deb.	912	5	812	Nil
	Brazil	—	—	—	—	—	—	—	—	—	—	17	9	512	912	Nil
	Buenos Ayres & Pacific	2,806	9.7.38	73,263	-	10,484	2	92,494	117,556	-	25,062	Ord. Stk.	1718	512	5	Nil
	Buenos Ayres Central	190	26.6.38	\$113,000	-	\$51,809	52	\$5,904,000	\$7,339,800	-	\$1,435,800	Mt. Deb.	4112	18	14	Nil
	Buenos Ayres Gt. Southern	5,084	9.7.38	127,171	-	18,672	2	163,337	159,615	+	3,722	Ord. Stk.	3354	1312	13	Nil
	Buenos Ayres Western	1,930	9.7.38	41,811	-	1,365	2	50,185	59,118	-	8,933	"	3154	1114	9	Nil
	Central Argentine	3,700	9.7.38	110,096	-	48,300	2	134,246	220,902	-	86,656	"	3414	1054	9	Nil
	Do.	—	—	—	—	—	—	—	—	—	—	Did.	2012	412	412	Nil
	Cent. Uruguay of M. Video	972	2.7.38	18,608	+	4,080	1	4,277	—	—	1,650	Ord. Stk.	6732	2	2	Nil
	Cordoba Central	1,218	—	—	—	—	—	—	—	—	—	Ord. Inc.	614	112	3	Nil
	Costa Rica	188	May, 1938	22,104	-	3,850	48	283,030	218,282	+	64,748	Stk.	38	27	2612	7916
	Dorada	70	June, 1938	16,500	+	2,500	26	95,700	90,400	+	5,300	1 Mt. Db.	107	106	105	51116
	Entre Rios	810	9.7.38	14,423	+	1,316	2	19,044	18,474	+	570	Ord. Stk.	19716	6	6	Nil
	Great Western of Brazil	1,092	9.7.38	4,100	-	2,500	28	187,700	206,400	-	18,700	Ord. Sh.	54	18	14	Nil
	International of Cl. Amer.	794	May, 1938	\$528,092	-	\$1,314	22	\$2,584,877	\$2,710,414	-	\$125,537	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	—	—	1st Pref.	21	11	12	Nil
	La Guaira & Caracas	221	June, 1938	4,600	-	770	26	30,235	33,705	-	3,470	Stk.	812	6	812	Nil
	Leopoldina	1,918	9.7.38	19,582	-	4,345	28	503,358	611,304	-	107,946	Ord. Stk.	914	3	2	Nil
Mexican	483	7.7.38	\$255,100	-	\$7,500	1	\$255,100	\$262,600	-	\$7,500	"	112	1	516	Nil	
Midland of Uruguay	319	May, 1938	8,322	-	153	48	104,249	96,221	+	8,028	"	178	12	12	Nil	
Nitrate	386	30.6.38	2,146	-	4,280	26	80,833	86,845	-	6,012	Ord. Sh.	3116	2	2	5	
Paraguay Central	274	2.7.38	\$3,263,000	-	\$2,325,000	1	\$913,000	\$1,487,000	-	\$574,000	Pr. Li. Stk.	84	7914	6212	958	
Peruvian Corporation	1,059	June, 1938	66,731	-	12,548	52	835,013	870,203	-	35,190	Pref.	1454	412	311	Nil	
Salvador	100	2.7.38	69,510	-	22,465	1	62,717	65,132	-	2,415	Pr. Li. Db.	2312	2112	2212	Nil	
San Paulo	1531	3.7.38	31,825	-	8,492	27	835,013	870,203	-	35,190	Ord. Stk.	9812	56	41	954	
Taital	160	June, 1938	2,298	-	820	52	39,100	41,035	-	1,935	Ord. Sh.	1716	5116	54	13516	
United of Havana	1,353	9.7.38	14,177	-	4,205	2	17,533	26,082	-	8,549	Ord. Stk.	558	5132	2	Nil	
Uruguay Northern	73	May, 1938	851	+	128	48	10,331	10,856	-	525	Deb. Stk.	10	2	2	Nil	
Canada	Canadian National	23,781	7.7.38	591,872	-	109,550	27	17,143,784	19,700,685	-	2,556,901	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—	—	4 p.c.	77	6212	6212	618	
	Grand Trunk	—	—	—	—	—	—	—	—	—	4 p.c. Gar.	10178	9412	10212	378	
Canada	Canadian Pacific	17,186	7.7.38	476,400	-	51,000	27	12,734,000	13,885,400	-	1,151,400	Ord. Stk.	18	714	7	Nil
India	Assam Bengal	1,329	20.6.38	38,520	+	1,767	12	299,591	287,119	+	12,472	Ord. Stk.	86	7312	788	3116
	Barsi Light	202	30.6.38	3,742	+	1,305	13	34,740	29,925	+	4,815	Ord. Sh.	6612	46	60	8516
	Bengal & North Western	2,116	20.6.38	78,702	-	2,305	12	713,273	743,616	-	30,343	Ord. Stk.	317	301	29112	6516
	Bengal Doonars & Extension	161	30.6.38	3,708	+	79	13	32,093	30,776	+	1,317	"	100	84	8512	7
	Bengal-Nagpur	3,268	20.6.38	193,125	-	2,295	12	1,647,867	1,666,913	-	19,046	"	101	89	92	48
	Bombay, Baroda & Cl. India	3,085	30.6.38	231,075	-	2,925	13	2,418,600	2,485,950	-	67,350	"	113	11012	11012	5716
	Madras & Southern Mahratta	2,967	20.6.38	157,500	+	11,098	12	1,310,496	1,284,763	+	55,733	"	110	105	107	8716
	Rohilkund & Kumaon	571	20.6.38	14,889	-	2,772	12	144,482	149,603	-	5,121	"	314	302	29812	6
	South Indian	2,531	20.6.38	119,313	+	8,485	12	962,782	947,306	+	15,476	"	10312	9912	10112	41116
Various	Beira-Umtali	204	May, 1938	84,595	+	434	35	693,281	585,391	+	107,890	—	—	—	—	—
	Egyptian Delta	620	20.6.38	5,124	-	552	12	44,265	45,926	-	1,661	Prf. Sh.	3112	34	34	Nil
	Kenya & Uganda	1,625	May, 1938	219,888	+	5,337	22	1,281,351	1,336,076	-	54,725	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	—	—	B. Deb	4812	4312	42	8516
	Midland of W. Australia	277	May, 1938	16,569	+	4,979	48	164,158	144,240	+	19,918	Inc. Deb.	98	9312	9312	414
	Nigerian	1,900	21.5.38	41,443	-	15,113	8	238,421	479,422	-	241,001	—	—	—	—	—
	Rhodesia	2,442	May, 1938	411,404	-	285	35	3,317,856	2,932,177	+	385,679	—	—	—	—	—
	South Africa	13,263	2.7.38	666,112	-	15,759	14	8,087,003	8,285,380	-	198,377	—	—	—	—	—
Victoria	4,774	Apr., 1938	871,575	-	13,545	44	8,166,486	8,519,336	-	352,851	—	—	—	—	—	

Note.—Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements are based on the current rates of exchange and not on the par value